Trains

February 1945

25¢

[A simplified Annual Report of the American Railroads in their third year at war]

IN 1944, the railroads rendered to the American public the greatest volume of service ever performed by any agency of transportation.

For doing this job, they received about 9½ billion dollars. That's a lot of money—but most of it was earned by hauling tremendous tonnages of freight for less than one cent per ton per mile and carrying passengers for even less than before the first World War.

Out of every dollar the railroads received—

38¢ was paid out in pay rolls.

29¢ was paid for materials and supplies of all sorts and other operating expenses.

19¢ was paid in taxes—federal, state and local.

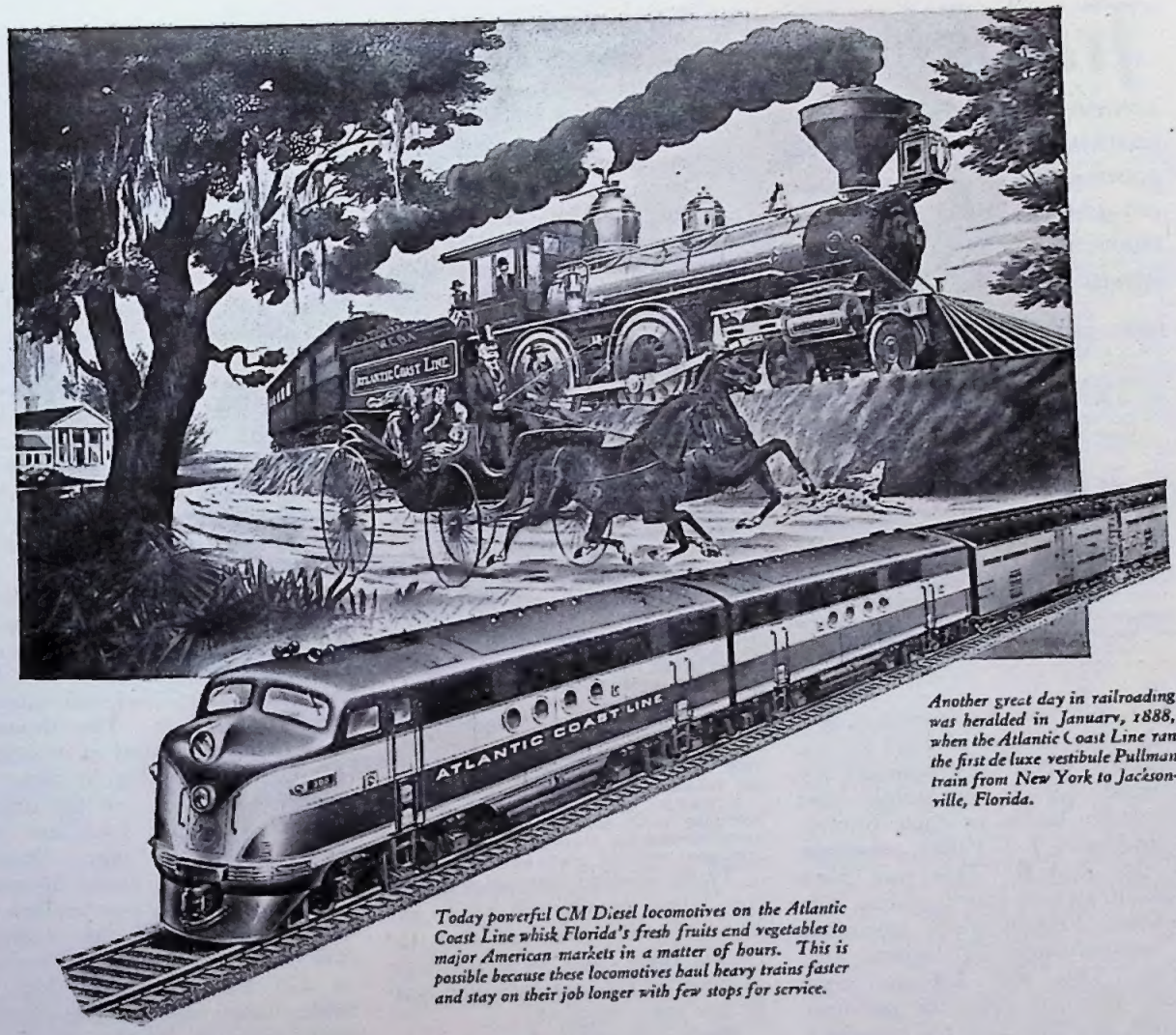
7¢ was paid in interest, rents and other charges—a great share of which went to insurance companies, savings banks, endowed institutions.

2¢ was paid in dividends to stockholders.

5¢ was left over in "change" to cover all such things as restoring roadways and equipment after the war, paying off debts, and providing reserves for the improvement of plant and the modernization of service necessary to keep pace with American progress.

BUY MORE WAR BONDS

ASSOCIATION OF
AMERICAN RAILROADS
ALL UNITED FOR VICTORY



Another great day in railroading was heralded in January, 1888, when the Atlantic Coast Line ran the first de luxe vestibule Pullman train from New York to Jacksonville, Florida.

Today powerful CM Diesel locomotives on the Atlantic Coast Line whisk Florida's fresh fruits and vegetables to major American markets in a matter of hours. This is possible because these locomotives haul heavy trains faster and stay on their job longer with few stops for service.

IT'S A GREAT NEW DAY FOR RAILROADING

ONE thing is certain—Americans will have an entirely new level of transportation, postwar. Two factors will make this inevitable:

The amazing achievements of the railroads under the stress of war.

The new and exciting prewar records for rapidity, regularity of service, safety and comfort the railroads had established with General Motors locomotives.

American railroads are in a favored position to lead in this fine new service because a most vital tool which makes it possible is fully developed and thoroughly proved. Already General Motors Diesel passenger and freight locomotives are operating on more than 100 million miles, annually, of regularly scheduled service. Yes, it's a great new day for railroading—with even greater days ahead.

ON TO
FINAL VICTORY
BUY MORE
WAR BONDS

GM
GENERAL MOTORS
DIESEL
POWER

LOCOMOTIVES . . . . . ELECTRO-MOTIVE DIVISION, La Grange, Ill.

ENGINES . . 150 to 2000 H.P. . . CLEVELAND DIESEL ENGINE DIVISION, Cleveland 11, Ohio

ENGINES . . . 15 to 250 H.P. . . . . DETROIT DIESEL ENGINE DIVISION, Detroit 23, Mich.

Trains

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American railroads produce the world's most efficient common-carrier mass transportation and are the foundation of our country's industrial productivity.

ALL previous transportation records were broken in 1944 by the railroads when they handled the greatest volume of freight and passenger traffic in their history, according to J. J. Pelley, president of the A. A. R. This was done without serious transportation difficulties. Freight traffic amounted to approximately 740 billion ton-miles. This was 1.8 per cent above that for 1943, the previous record, and 2⅕ times the ton-miles moved in 1939.

Railroads handled this enormous traffic load in 1944 with virtually the same number of locomotives and with hardly more than a nominal increase in the number of freight cars compared with 1939. There also was only a slight increase in the number of passenger cars.

Freight carloadings in 1944 totaled approximately 43,500,000 cars, or an increase of 2.5 per cent above the preceding year. The increase in the number of freight cars loaded and longer hauls per ton accounted for the increase in the ton-mile volume of freight.

Passenger traffic in 1944, too, was by far the greatest for any year in railroad history. It amounted to 96 billion passenger-miles. This was an increase of 9.3 per cent above 1943, and 4⅕ times what it was in 1939. This unprecedented movement of passengers resulted in part from Army troop movements, more than 10,700,000 men having been moved in special trains and special cars alone. This number does not include the millions of soldiers, sailors, and marines on traveling furlough, nor does it include small groups of individuals moving on order, nor Navy and Marine Corps movements, nor prisoners of war.

Outstanding operating records established by railroads in 1944 follow:

1. Average load of freight per train was 1144 tons, the highest on record. In 1943 it was 1116 tons.
2. Performance per train more than doubled in 20 years, gross ton-miles per freight-train-hour having increased from 18,257 in 1924 to 37,548 in 1944, while net ton-miles per freight-train-hour increased from 8222 in 1924 to 17,745 in 1944.
3. Average daily movement of active freight cars was 52.8 miles in 1944, compared with 52 miles in 1943.
5. The average number of passengers per car and per train was much greater than ever before.
6. Average revenue for hauling a ton of freight one mile was 0.942 cents, compared with 1.116 cents 20 years ago.
7. Average capacity of freight cars was 50.9 tons at the end of 1944, the highest on record.
8. Tractive power of steam locomotives averaged 53,000 pounds, the highest ever recorded and an increase of 33 per cent compared with 20 years ago.

Traffic leveled off noticeably in the latter months of 1944, and present indications are that the record high mark in the volume of both freight and passenger traffic has been reached.

From a financial standpoint, the results in 1944 were not as satisfactory as in previous years. While gross revenues continued to follow the line of increasing traffic, the peak in net earnings was reached in 1942 and has been declining since then. Gross revenues in 1944 were more than two billion dollars higher than in 1942, but net railway operating income was off 340 million dollars. This has been due to higher wages and taxes and to increased cost of materials and supplies. Since the beginning of the present war, these costs, other than taxes, have increased by more than 25 per cent.

Railroad taxes in 1944 were by far the highest on record, amounting to the unprecedented sum of $1,900,000,000. In order to meet taxes alone, railway revenues from 73 days of operation were required in 1944.

Expenditures for fuel, supplies and materials used in current operation by the Class 1 railroads amounted to approximately $1,600,000,000 in 1944, compared with $1,394,281,000 in 1943.

Capital expenditures in 1944 for equipment, roadway and structures and other improvements to property are estimated at $550,000,000 compared with $454,282,000 in the preceding year.

Grand Central Face Lifting

So well has Grand Central Terminal in New York withstood the years that few of the 60 million passengers who use it annually suspect the structure is nearly 32 years old. The marble of the vast interior looks practically new. But the painted design on the starry, vaulted ceiling of the main concourse with its myriad twinkling stars outlining the heavens from October to March grew dimmer and dimmer. It is now hidden from public view by an immense scaffold and the plaster has been patched and covered with asbestos-cement paneling. The design is now being repainted in its original cerulean blue and gold under the supervision of one of the original artists. Principal stars are indicated by electric lights. Only by looking up at the flylike figures on the scaffold does one realize that the great arch of the ceiling is 117 feet from the floor. The room is 275 feet long and 120 feet wide. After the ceiling is restored, and it will take 'til May, the frames of the 75-foot-high windows in the east and west ends of the concourse will be painted and the walls will be steam-cleaned.

Busy Pennsy Line

One of the busiest of the many Pennsylvania Railroad lines is the Maryland Division, whose main stem extends from Washington to Brill Tower, just outside Philadelphia. With the tremendous number of trains moving over this line, some relief was needed for several of the bottleneck sections. Therefore approximately 21 miles of third track and seven of fourth track were built, and in addition another 48 miles of double track were signaled for operation in either direction, as well as similar signaling on the third track in many places. With these improvements, the Pennsylvania now has the near equivalent of a four-track main line from Washington through to Newark, N. J. (just 10 miles short of New York), and the num-

ber of trains on this line—particularly on week ends—has resulted in the application of a common phrase: "It's just like a streetcar line—a train every couple of minutes." Without taking any credit from the marvelous job which the Pennsylvania is doing, it is interesting to theorize on just what they would be doing today over this section of railroad if they were still using the good old steam engines.

Postwar Passenger Trains

About the only sure thing about postwar passenger service at this time is that thousands of new passenger cars will go into service about as fast as the plants can turn them out. How fast they will run, how they will be used, and what the fare base will be remain subjects of much discussion.

The heavy pounding which wartime traffic has given thousands of old cars may have as large a part in stimulating purchase of new cars as will the proved profitability of streamlined trains. Certainly the car builders will have plenty of orders for at least a time, and roads are at present placing general orders or reserving space so that they can get new equipment in service while new war-enforced customers are still riding the rails.

New York Central has the largest order so far, 300 cars. Canadian Pacific is inquiring for 10 baggage-express, 35 coaches and 5 roomette sleepers. Wabash has ordered a seven-car streamliner, Chicago & North Western has reserved car-building space for an extension of its *"400"* fleet and replacement with new of all early streamlined cars which have been added during wartime to its present streamliners. The Illinois Central is considering a new streamliner for the Chicago - St. Louis run and the transfer of the *Green Diamond* to Chicago - Waterloo (Ia.) service. Santa Fe has 80 cars on order and will extend streamlined service from Fort Worth to Galveston. The Southern Pacific expects to re-equip the *Cascade*, crack train between San Francisco and Portland. Northern Pacific has reserved car-building space, probably for new *North Coast Limited* cars to compete with the new *Empire Builder*. Louisville & Nashville plans a Cincinnati - New Orleans streamliner. The Rock Island has asked bids for cars to extend its streamlined service, particularly on medium-length daytime runs, and Pere Marquette has reserved car-building space. Rio Grande has ordered 10 cars and Seaboard 25. C&EI plans a Chicago - St. Louis streamliner. In fact, almost every road in the passenger business has plans for some new passenger equipment.

As to how the new equipment will be used, there is no such unanimity. The streamlined train originated, in the Union Pacific M-10,000 and the Burlington *Pioneer Zephyr*, as a small-capacity unit train to win busineess back to the rails on light traffic lines, but it quickly grew to its greatest prominence in 17-car trains like the *City of San Francisco* and *City of Los Angeles*, handling the finest of through business over long hauls. It has demonstrated its ability to make money wherever applied, and the predominant tendency of railroad management is to spend what money is available for streamlining on the through mainline trains where the largest return can be earned. There is, however, some opinion in the industry that light-traffic runs can be brought back into the profit column by use of streamlined trains more like the original three-car units, and that even on main lines several short trains giving more frequent service would be better than a single very long train, economical though the long train may be from the operating standpoint. As Colonel E. J. W. Ragsdale, chief engineer of the Edward G. Budd Company, has said, "After the war it will no longer be a problem of packing them in, but of getting them in."

As to speed, it is probable that trains will not run much, if any, faster than the best prewar schedules. But many, many more trains will be on the fast timings, and much thought is being given to the segregation of head-end traffic so as to eliminate the station delays in handling mail and express which slowed down so many otherwise fast trains in prewar days. The coach streamliner has shown that on any route with a reasonable potential traffic it can make enough money on passengers alone, and head-end business can be handled on other trains.

The first speedup to be definitely announced is the Great Northern's *Empire Builder* [December 1944 TRAINS], and while the exact schedule hasn't been set it is known that about one-half day will be knocked off running time. The Big G is fortunate in having a mail train, Nos. 27 and 28, to handle head-end and local business. The Milwaukee's *Olympian*, on the other hand, must not only handle head-end business but make dozens of conditional and local stops, so that any extensive speed-up would necessarily involve a new train over much of the route.

Another speedup much talked about is from New York to Chica-

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A Santa Fe freight train in New Mexico.

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go. Best prewar schedules were 16 hours. New York Central, after its experience with the *Empire State Express*, would like to put a daytime streamliner on the run, but even the much-discussed 14-hour schedule would give bad departure and arrival eastbound. Westbound (crossing the time zone makes the difference), a 14-hour schedule could have a 9 a. m. departure and a 10 p. m. arrival.

A New York Central passenger-preference survey shows that most passengers think present fastest schedules are about right.

The convenience of arrival and departure times will continue to be more important than mere elapsed time, especially on overnight trains. And don't think that there won't still be plenty of overnight runs, in spite of the new popularity of daytime coach trains. While Pullman travel on long-distance limiteds is particularly vulnerable to plane competition, overnight journeys of 400 or 500 miles will still be most conveniently made between bedtime and breakfast in Pullman rooms which offer more comfort than competing transportation.

C&O Research

The three C&O lines—C&O, Nickel Plate and Pere Marquette—have created a joint department of research engineering and have retained Kenneth A. Browne, formerly research engineer and technical consultant of Wright Aeronautical Corporation, as research consultant. Mr. Browne will initiate and direct studies and experiments looking toward more efficient use of material, equipment, and facilities.

Fortune Covers Rock Island

The Rock Island railroad is thoroughly covered in the December number of *Fortune*, which not only describes the road and its recent history in *Fortune's* usual exhaustive detail, but also uses Rock Island as an example of self-liquidating capital expenditures which railroads can make upon reasonable assurance of a moderately prosperous level of revenue. These expenditures on RI *Fortune* estimates as 95 million dollars.

The possibility of converting the Rock Island into a super-railroad which could move 5000-ton freight trains at an over-all average of 40 miles per hour and passenger trains at 75 miles per hour including stops is also examined and the cost set at 210 million dollars.

Expanding from the Rock Island amounts, *Fortune* figures the railroads as a whole could spend at a minimum 5 billion dollars on self-liquidating improvements, while at least 10 billion would be needed to make super-railroads of the better lines. This latter is substantially the same figure set by John W. Barriger III in his article "Super-Railroads" in TRAINS for December, 1943.

Fortune sets up these opportunities for capital in the railroad business as a challenge to those who favor an economy of expanding private enterprise. It concludes that one of the greatest opportunities for private enterprise lies in removing the causes which make railroad management wary of expenditures of such magnitude.

New Passenger Cars Authorized

The War Production Board has cleared the way for the first passenger-car building since early 1942 with the allocation of materials for 40 aluminum and 15 steel cars now on order with the American Car & Foundry Company. Twenty of these are for the L&N, 20 for NYC, 2 for Western of Alabama, 8 for Central of Georgia, and 5 for Nickel Plate.

Odds and Ends

"A modern and entirely different" railroad terminal is promised Miami by the duPont interests "as soon as the I. C. C. approves the Florida East Coast reorganization and permits us to assume control." The duPont interests now hold some 70 per cent of FEC stock. . . . Signaling equipment has been ordered for the new Milwaukee-Rock Island bridge across the Missouri River and short route into Kansas City, which is nearing completion. The new route will enable the Milwaukee to use its large power into Kansas City, and will save turning of through Rock Island trains at the Kansas City Union Station. The Milwaukee's new freight and engine terminals are being developed jointly with Kansas City Southern. . . . The Burlington has 69 special freight cars 12 inches wider and 19 inches higher than ordinary box cars and 60 cars 26 inches higher than normal but of usual width. These cars are used for carrying large sections of bombers to the Martin plant south of Omaha for assembly.

Rock Island's *Rocky Mountain Rockets*, operated between Chicago and Denver - Colorado Springs, have completed four million miles in the last five years, with substitute equipment used on only 30 of 3656 trips. With running time of slightly over 19 hours, servicing time at terminals is very short and the record of 99.18 per cent availability shows not only good equipment performance but excellent railroading. . . . The efficiency of the nationwide Pullman network which the Federal Court decision is breaking up is shown by the fact that in 1943 the Pullman fleet of cars— 25 per cent of the country's cars in number and only 11 per cent of the country's normal passenger car capacity—carried 30 per cent of the total passenger miles! . . . The Reading is rebuilding 20 of its heavy Consolidations into modern 4-8-4's with new tenders. Construction will start in May and two locomotives will be finished each month at the Reading (Pa.) shops. . . . The first box car with a complete aluminum exterior above the floor line has been completed by the Great Northern. It is plywood-lined and equipped with high-speed trucks and passenger car air and heat lines so it can be used in high-speed express service.

A Spanish train, reported in the press to have made 80 miles per hour on sharply curved mountain trackage, has extremely short car units, each carrying only two independently sprung wheels at its rear end and articulated to the unit ahead. The over-all height above rails is only 7 to 8 feet and the car floor is only 12 to 14 inches above the rails. . . . The Santa Fe has ordered 10 more 5400-horsepower Diesel freight locomotives from Electro - Motive, which gives it a total of 78 such locomotives in service or on order. Pacific Great Eastern [December TRAINS] has ordered two new Mikado-type locomotives. . . . M&StL has ordered two three-unit freight Diesels from Electro-Motive. . . . Missouri Pacific will install 41 miles of block signaling between Forest Hill and Kinder, La. . . . The New York Central

Ranny Routt, *Washington Evening Star.*

Something unheard of in railroading occurred December 23, when the Washington Union Station closed its doors! The photo shows the 760-foot concourse which was designed to accommodate 25,000 people at one time. Conservative estimates place the number in the station that Saturday afternoon at 100,000. All ticket sale records were broken with $235,000. Congestion began getting serious about noon, and when trains left with passengers hanging on the steps, additional police were called. The doors just couldn't be closed, for no one would get off and hundreds more were still trying to get aboard. By 4:30 the situation had become very serious as passengers packed the concourse and some had even succeeded in scaling the high iron fence. Late in the evening several railroads stopped ticket sales entirely for a several-hour period. Regardless of whether a passenger held Pullman or coach reservations, it was almost an impossibility to get to the train, resulting in a great deal of Pullman space going out empty. Crews had to be taken out to the trains by way of the post office and the mail ramps. Something drastic had to be done, so the station was finally closed until some order could be restored.

has a new all-coach train, the *Paul Revere*, between Chicago and Boston on schedule comparable to the New England States.

Because of so many baggage cars being used in troop service this year, many of the large railroads used box cars for handling the Christmas parcel post. Many of these cars are equipped with steel wheels and steam heat connections and thus could be operated in regular passenger trains. Others had to be confined to special mail and express sections. . . . Diesel freight locomotives on the Fitchburg Division of the Boston & Maine have resulted in reduction of fast-freight running time between Boston and Mechanicville by from 1 to 1½ hours. Boston to East Deerfield is scheduled at 3 hours, about 33 miles per hour. . . . An automatic electropneumatic door opener features a sleeping car just rebuilt by Canadian Pacific in its Angus shops, Montreal. . . . The Southern Railway operated a total of 5635 passenger trains during the month of October last year, and this figure included 4718 regular trains and 917 special trains and extra sections.

One British railroad alone, the LMS, runs an average of 100 special trains a month carrying mails destined for Allied troops on the continent. . . . The Pennsylvania has an N&W streamlined 4-8-4 on the Fort Wayne Division for test purposes. It has pulled freight and on New Year's Day left Chicago on the *Broadway Limited*. . . . The C&EI has a new herald, an oval with the slogan "The Chicago Line" and the words "Speed" and "Service." It is being painted on all the road's rolling stock, and on locomotive cabs is in color, the orange and blue of the University of Illinois. . . . C&EI has rented two Pacifics from the IC. . . . The Pere Marquette is having a new car ferry built at Manitowoc, Wis., for service across the Detroit River. . . . The first roomette sleeping cars in Canada make up part of an order for new rolling stock for Canadian Pacific. . . . Newly painted Canadian National cabooses are bright orange for greater visibility, particularly when clearing sidings with long trains. Underframes and roofs are standard boxcar red.

The Frisco is just finishing a line relocation at Dixon, Mo., which will shorten postwar running time between St. Louis and the Southwest by at least half an hour. Dixon Hill has been cut from 2.30 per cent ruling grade to 1.27 per cent, and two miles of line and three complete circles of curvature have been eliminated. Thousands of dollars in annual helper engine expense will be saved. Cost of project is more than $1,300,000. . . . The B&O's all-coach streamlined *Columbian* is being changed to Diesel power. . . . Continued delays in the southeastern part of the country result sometimes in Florida - New York streamliners being turned at Washington instead of being run through. This means New York passengers must transfer, but it is the only way of getting the trains back on schedule for the southbound trip.

A. C. Kalmbach.

MRS in Italy

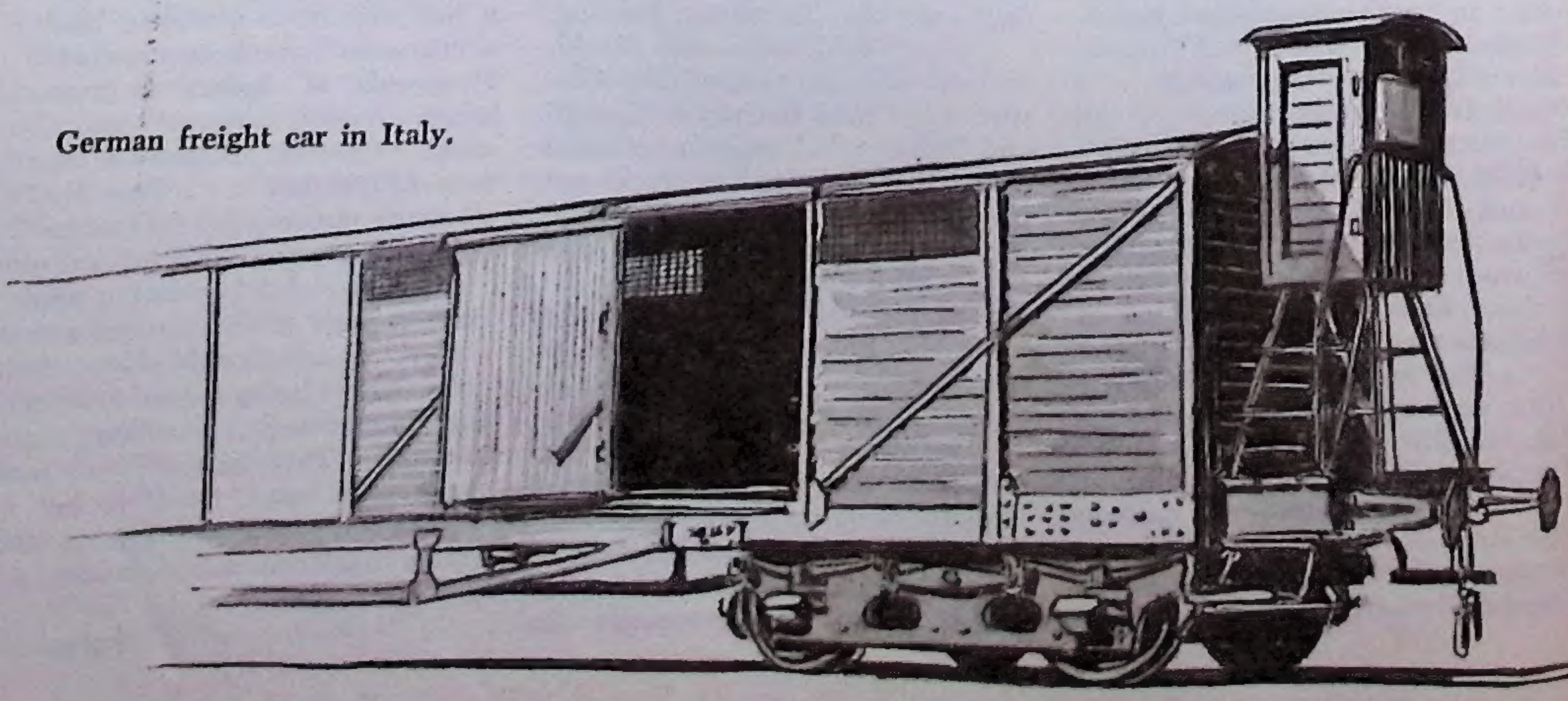
Illustrations and story
by Lt. Gilmore W. Reid

MANY a G.I. has taken a ride on an Italian railroad. Perhaps the comfort couldn't be compared to the good old American tradition, but the fact that he reaches his destination safely is a tribute to the Military Railway Service.

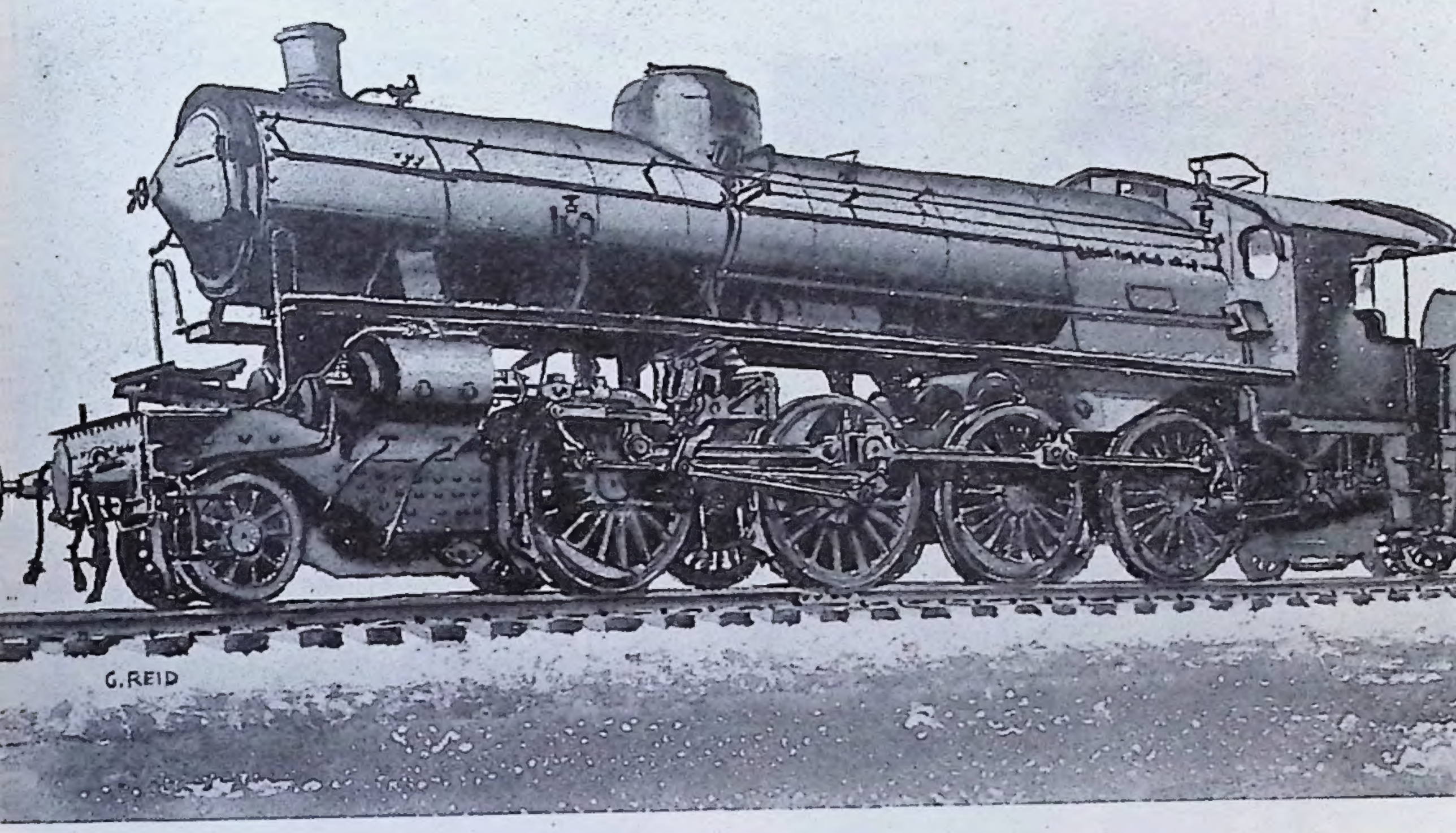
MRS has taken over complete operation of standard Italian railroad lines, and since October, 1943, has pounded and welded wrecked equipment back into shape by veritable trainloads. Giant re-electrification programs have been started. Interlocking systems have been built. Italian locomotives have been reshopped right down to the last rivet and shrapnel hole, and hundreds of burnt-out cars are now back in service.

MRS is composed of many outfits, broken down into various units such as Diesel maintenance, track repair, shop, crew operating, dispatching. The military railroad is divided into operating divisions as is the practice in the United States.

Track repair outfits take care of battle-won right of way and also maintain the iron already in Allied possession. Dispatching handles the train orders all the way from the chief dispatcher down to the operator out in some



German freight car in Italy.



lonely passing siding. The crew operating unit handles anything that will pull cars, and the shop and Diesel maintenance boys keep the motive power and rolling stock glued together.

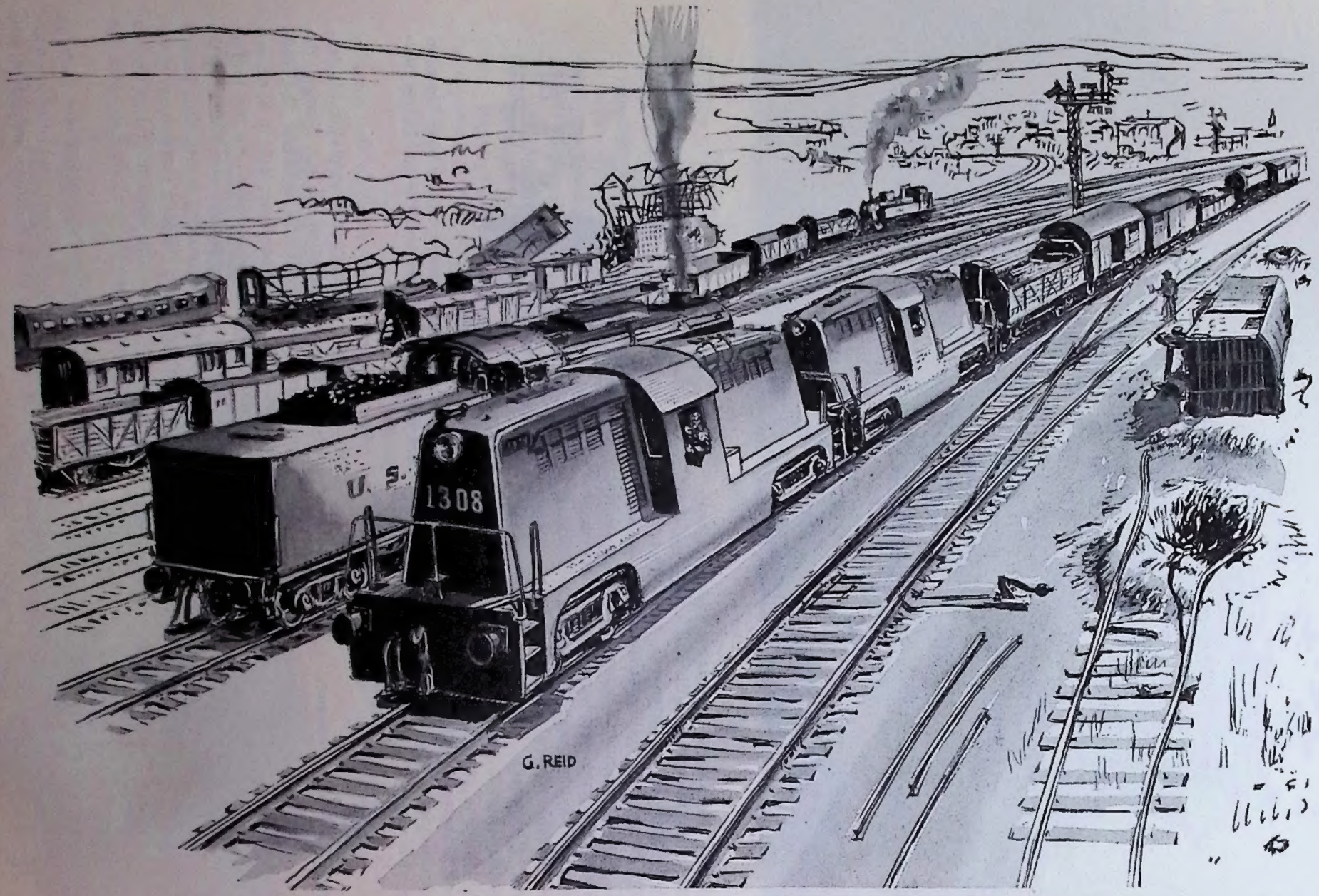
It's not a bit unusual to see a multiple-unit 1300 series Diesel switcher hauling a bunch of four-wheel wagons past a waiting 2-8-0 "Americano" while, several tracks away, an Italian 0-8-0T stubbornly balks a string of empties through a puzzle switch.

Every yard crew has an Italian railroader to help interpret signals and orders. Most of the railroaders understand basic Italian, but once in a while a situation comes up requiring a steady debate, developing into what resembles an argument over a stolen base between the Brooklyn Dodgers and the St. Louis Cardinals.

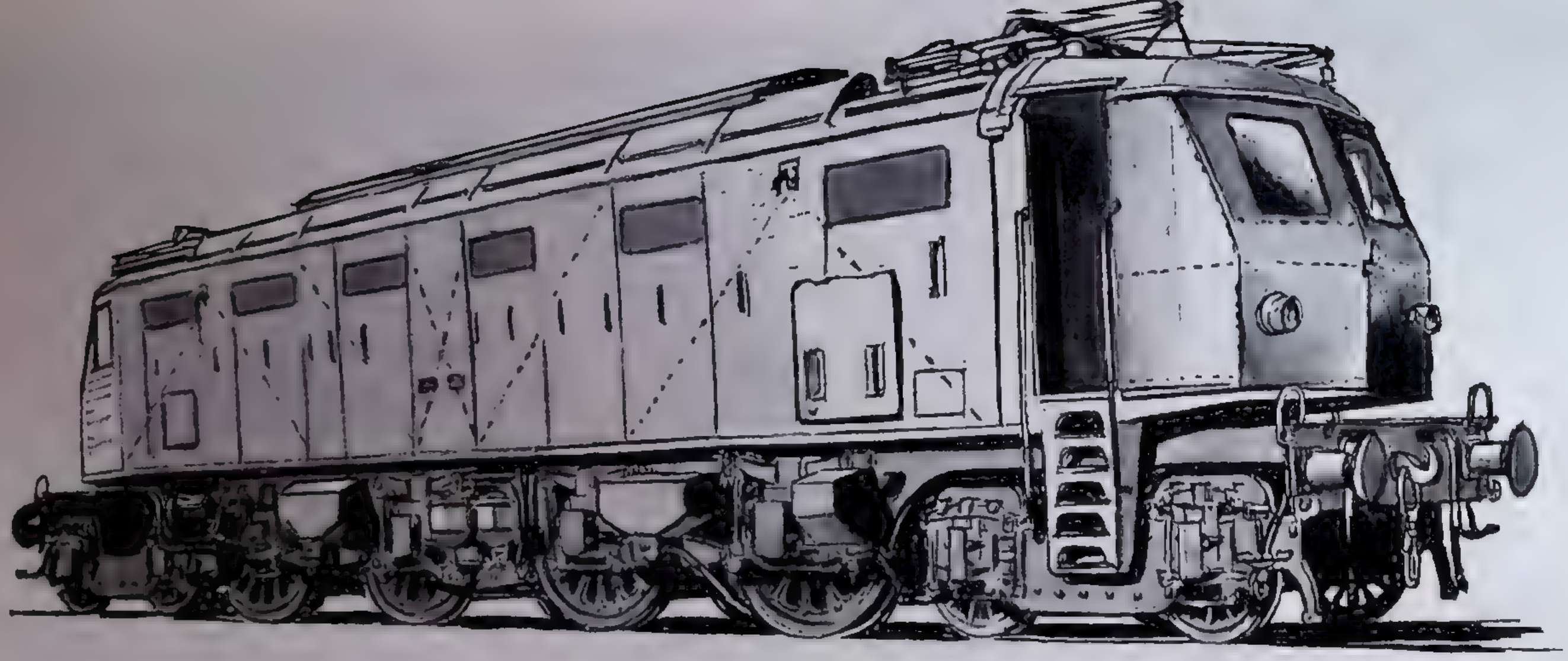
Another noteworthy scene is the coupling of cars. While the hogger is applying his talents to the manipulation of his charge, the brakie nonchalantly waits between the rails in front of the designated car, link in hand and eyes on the approaching hook. As the buffers clink together, he deftly flips the link over the hook and twirls a tightening screw, thus joining the two 40 & 8's into railroad matrimony, never to be parted unless the engineer takes too big a bite on the throttle and disembowels the draft gear.

European railroads are noted for lack of musical appreciation as far as whistles are concerned, and this used to cause no end of woe

Hospital train and ambulance.



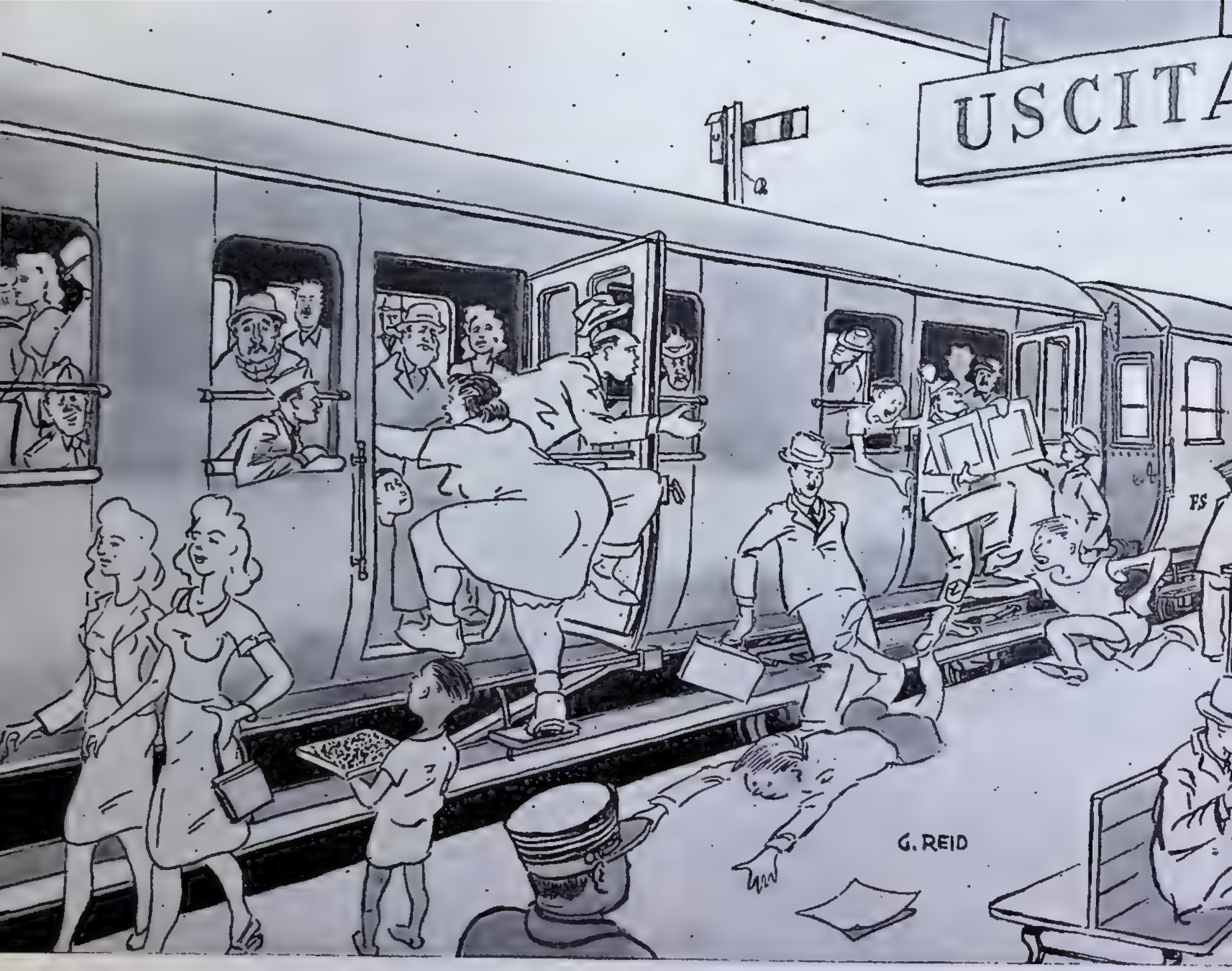
Yard scene in Italy after the Military Railway Service took over. Overturned car and twisted rails at right give an idea of conditions after German evacuation.



G. REID

G. REID

At left, an Italian electric locomotive. Below, a third-class coach, a number of which have been converted to hospital cars. Seats were ripped out and bunks put in their place; most doors were welded shut and the remainder were enlarged to accommodate litters. The cars were painted olive drab with big red crosses on roof and sides.



for the MRS boys who yearned for a touch of home, just like thousands of other soldiers overseas. So Lt. Paul T. Roberts, who used to work for the Big Four at Beech Grove Shops, supplied the missing link in the form of a real old-fashioned tooter. The American-built 2-8-0's were coming overseas with very shrill single-bell whistles that were barely one step ahead of European practice. Off went the G. I. whistle and on went the "Roberts Chime." Now, every once in a while, a homesick lad may hear echoes of the Frisco, or the Wabash, or the Monon, for that is just about how the whistle sounds. Those of you who are musically inclined, grab a piano and strike these notes as one: C, D sharp and A sharp. There you have it—No. 1674, in person.

General Gray, who is the proud commanding officer of MRS in the Mediterranean area, heard the whistle and was so pleased that he ordered duplicates made for all engines operating out of Lt. Roberts' roundhouse.

There is a legend back in the hills that when the 1674 first gave vent to its new deep-throated voice, hundreds of G.I.'s appeared from nowhere, as if by magic, their "A" bags all packed, thinking that the boat for home had finally come!

Italian electric equipment is surprisingly modern. Two types of electric power predominate: the 4-4-4 and the 4-8-4. The 4-4-4 looks like something out of an Ives catalog, and the 4-8-4, a higher-drivered locomotive, would pass for a New Haven engine any day. Some M.U. trains are dead ringers for New York subway cars.

The steam locos are quite mixed in appearance. Yard engines range from 0-6-0T's through 0-8-0T's, 2-6-0's up to 2-8-0's. The road engines are all two wheel-pilot jobs, mainly 2-6-2's and 2-8-0's. The 2-8-0's are sleek jobs, some with inside-coupled main rods. A lot of the existing Italian equipment was built by American designers about the time of the last war. All tank truck wheels are spoked, as are the pilot and trailer wheels on engines. The Italian hogger and firemen have no cab seats, probably due to the fact that space is very limited on the footplate of the Italian engine. Water is of a poor quality, and this probably

accounts for the copper fire box and boiler tubes. Coal is of a very poor grade. In fact, grass probably would grow quite well in the fertile coal bunkers.

To ADEQUATELY describe the condition of the Italian rail lines when MRS took over in 1943 would take volumes. The retreating Germans were thorough in their destruction. Every rail, switch and frog received individual attention. Their purpose was quite evidently not merely to delay, but to destroy in its entirety the "Road to Rome."

The overhead catenary hung uselessly from every pole, its wires ready to foul anything on wheels, even a push car. It was necessary to cut the wire down. Overhead bridges and foot walks which had been blasted onto the right of way had to be broken up and carted away before the ruined rails could be replaced. There was no general stores department to call upon for rail and fittings. A stock pile, if it could be called that, was gleaned from unused sidetracks and industrial sidings. For long miles on end the right of way failed to yield one usable piece of material.

Such was the condition of what was once one of the finest railroad systems on the continent. From this scrap heap General Gray's men resurrected a railroad which today is doing its bit in the fight against the Nazis.

"The Blackmarket Special" is the title the artist gave this scene (left, above) at Uscita, typical of Italian station scenes. Below, when a G. I. locomotive clanks down Italian iron, the entire scene takes on an "American" look.

Along the Soo Line

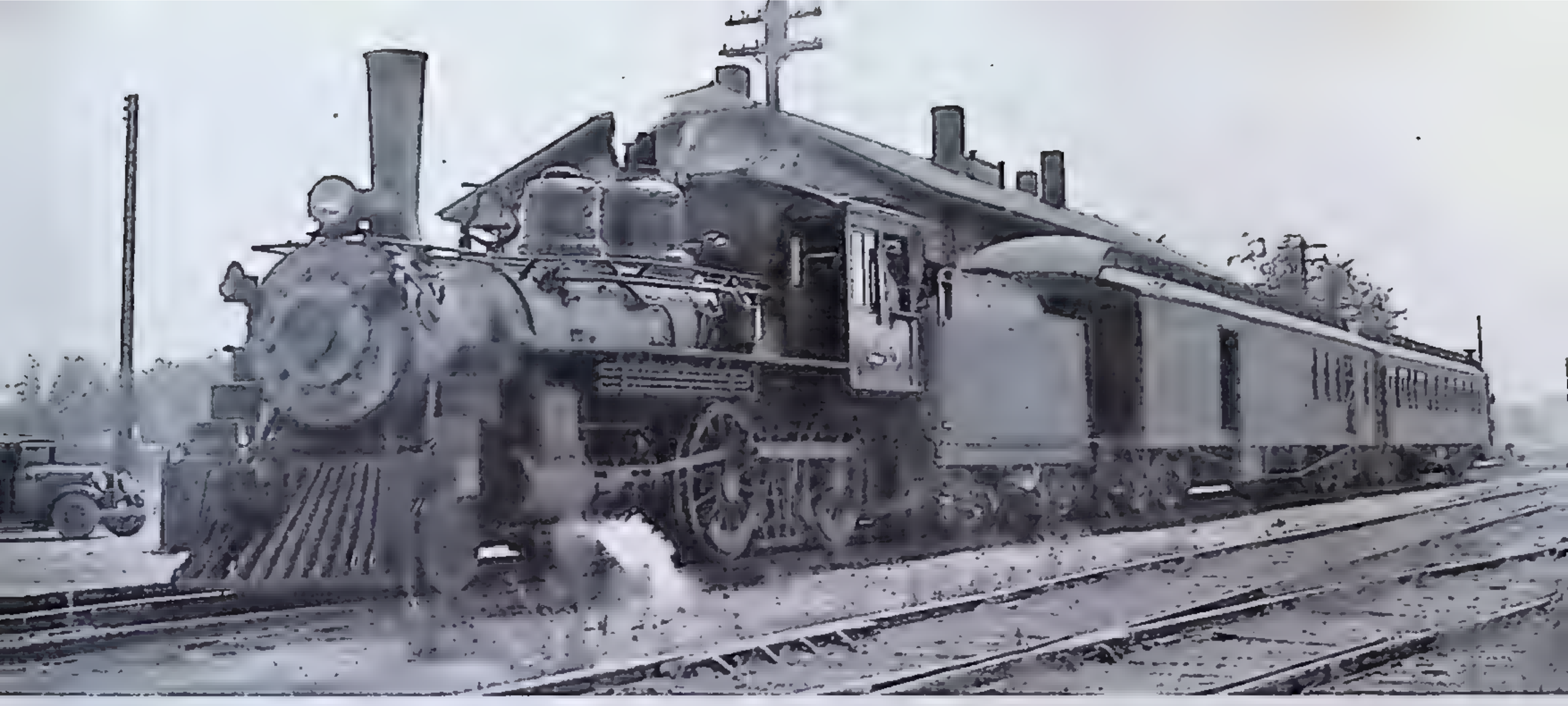
Canadian Pacific subsidiary has scenic route, colorful trains

THE Minneapolis, St. Paul & Sault Ste. Marie Railway is a 4276-mile midwestern line which, as a subsidiary of the Canadian Pacific, gives that road its connection with St. Paul, Minneapolis, Duluth, and Chicago. Most of the Wisconsin lines of the Soo are the Wisconsin Central, which is operated as a part of the system and is included in the total mileage figure.

Passenger traffic is relatively small, but the man who departs from the beaten track to use the daytime Soo trains between Chicago and the Twin Cities will be rewarded by excellent scenery and a comfortable ride. Passenger cars are painted in CP livery, tuscan red. The center photo on the opposite page and the left-hand photo above show the eastbound day train, No. 2, while the night shot is of one of the overnight trains, No. 17, at Waukesha, Wis.

Most of the road's revenue comes from wheat, iron ore, lumber, coal, and petroleum products, in the order listed, and merchandise trains of remarkably varied cargo keep the rails glistening. Most heavy freight is pulled either by 4-8-4's or by the 4000-series Mountain types (photo above). American Standard No. 25 (opposite page) was still running out of Gladstone, Mich., in 1936. Old-time scene below was at Valders, Wis., in 1916.

Photos: Upper left, E. Bruce Miller, 924 N. 25th St., Milwaukee, Wis.; upper right, TRAINS collection, from Robert Graham; below, E. Bruce Miller. Opposite page: Top, D. W. Yungmeyer, 5116 Dorchester Ave., Chicago, Ill.; center, S/Sgt. Roland Wicke, Fond du Lac, Wis.; bottom, E. Bruce Miller.



Winnipeg
Whitetail
Duluth
Sault Saint Marie
Minneapolis, St. Paul
Chicago

Mainline Hot Spot

BY RICHARD H. STEINMETZ

Harrisburg, Pa., is junction of five divisions and five branches of two important railroads

For its size, Harrisburg, capital city of Pennsylvania, is unquestionably one of the busiest of the nation's division points and terminals. Although many other division points are larger, Harrisburg is important as the western terminus of the Pennsylvania Railroad's sprawling electrified trackage and the hub of a maze of railroad comprising parts of five divisions and five branch lines.

Nearly a century ago the great Pennsylvania Railroad system, "the standard railroad of the world," was born here, and since that distant day the voice of the railroad has become part and parcel of Harrisburg life. Rail-borne traffic flows in an ever-increasing stream through the two passenger terminals and the three big freight classification yards. More than 200 scheduled passenger trains arrive and depart from the PRR and Reading Company stations every 24 hours, and these are augmented by numerous extra sections and special movements.

A never-ending symphony of railroad sights, sounds and smells emerging from the mighty girdle of steel that encircles the city immediately impresses upon the visitor the importance of railroad transportation. The greater portion of the city is completely surrounded by the tracks of the PRR and Reading Company. North, east, south and west, never silent day or night, year in and year out, the hot rails sing their strident song.

A bustling railway postoffice terminal and a big express transfer add to the multitude of railroad activities that now employ upwards of 15,000 residents of the city. Every phase of railroading, except marine facilities like those of our seaport cities, is represented.

Here was a favorite haunt of the railfan in the days before Pearl Harbor. An endless variety of rolling stock and motive power is on parade, a condition that has been aggravated during the past few years by the increasing amount of interchange of passenger equipment between the big systems. In the high-roofed old-time Pennsylvania trainshed, cars from many of the big railroads of the country pause daily, and the Reading Company's Rutherford enginehouse shelters and services Western Maryland, Jersey Central and Pennsy engines in addition to its own. It is the end of the run for the huge GG-1 and P-5 electric engines from Philadelphia and New York. The more picturesque K-4's and M-1's carry on to the north, south and west.

Lt. J. W. Maxwell, U. S. Army.

The big 50-stall PRR roundhouse at Maclay Street services mostly passenger stud, both electric and steam, while the Enola enginehouse takes care of hundreds of steam and electric freight engines daily. Today, however, no one is allowed to photograph or visit any part of the facilities.

A never-ending procession of symbol freights, sleek streamliners, hotshot mail and express trains, locals and extra freights roll 'round the clock. All of the Pennsy's big "Blue Ribbon Fleet" stop here, and during the early evening and morning hours, westbound and eastbound name trains follow one another in an almost endless procession. Two, three and sometimes four are arriving and departing at the same time, and all 10 tracks of the terminal are in use. Consequently, the men who handle the two terminal towers controlling the station trackage and the approaches have plenty to do and little time to do it in. Add five or six shifting-engines buzzing around and an extra freight or two to put over the two freight leads to the main line, and it is easily understood why these tower jobs are not bid on in a hurry. In spite of all this activity, accidents rarely happen, and no serious wreck has occurred for many years.

Converging here are four divisions and one branch of the Pennsylvania Railroad and one division and four branches of the Reading Company. The four-track Middle Division of the Pennsy ranks first in importance. Main line to the west, it carries more traffic than any of the others and is one of the favorite haunts of the steam fan. Ranking next is the Pennsy's Philadelphia Division, consisting of the main line to the Quaker City via Lancaster, the low-grade freight line from Enola to the Trenton cutoff, the river route to Perryville, Md., and the Cumberland Valley Branch to Chambersburg, Hagerstown, Md., and Winchester, Va.

The Williamsport Division, to the north—road to Elmira, Sodus Bay and Buffalo, N. Y., and Erie, Pa.—rates on a par with the busy Baltimore Division to the south. Both of these divisions comprise parts of the old Northern Central Railroad which came into the Pennsylvania Railroad family a long time ago. The *Liberty Limited* and other name trains bound for the nation's capital roll southward out of Harrisburg to York, Baltimore and Washington over a curving and picturesque route.

Last, but not least in the Pennsylvania Railroad connections here, is the Cumberland Val-

Top, A. R. Arment, 1127 Upland St., Chester, Pa.; bottom, N. R. H. S., R. H. Steinmetz collection.

Double-headed, an eastbound hotshot freight heads out of Enola Yards over the Philadelphia low-grade line. Below is Harrisburg's Pennsylvania station during the big flood of 1936. The two K-4 Pacifics at bottom of opposite page are getting a 13-car passenger train started out of Harrisburg over the Middle Division (westbound).

ley Branch of the Pennsy's Philadelphia Division. Older than nearly all other parts of the system, it declined in importance in recent years but now is staging a comeback. To old-timers who remember the halcyon days of the CV when it was an independent railroad, the revival of its importance is bearing out their contention that the bigger railroad did not concern itself too seriously with this feeder from Winchester, Va., and Hagerstown, Md. Time was when the Cumberland Valley boasted the best-kept property in the country. Brass hats from all over the world came to view the "perfect roadbed," the beautifully arranged and landscaped station grounds and the high-stepping, brightly polished 4-4-0's which wheeled the "varnish" down the valley. Even the freight hogs and yard goats were things of beauty, and the morale of the men who manned this unusual road was topnotch. The deterioration that came with its absorption into the larger system was only natural, but it has not wiped out the traditions of the days when the Cumberland Valley Railroad operated the first

Courtesy Pennsylvania Railroad.

sleeping cars in the world over its tracks between Harrisburg and Chambersburg. Although the Cumberland Valley today definitely lacks the glamour that surrounded it then, it still is an important and picturesque route. Present passenger service is furnished by three round trips daily to Hagerstown, where connections are made with a mixed train to Winchester, Va., and with the Norfolk & Western. Three N&W cars are operated in through service on two of these trains and a through Pullman is carried on the night trains between New York and Bristol.

Every morning at 8:30 and every afternoon at 4:30, the Reading Company-Jersey Central's fast *Harrisburg - New York Express* departs. It consists of standard coaches, Pullmans, and a diner, with a sleek Jersey Central Pacific on

Optional routes

Each month TRAINS prints a brief listing and survey of available routes between larger cities.

Buffalo and Chicago:

New York Central°†—Several overnight trains with local and through sleepers via main line; also day trains. All carry coaches. Standard fare, interchangeable with Michigan Central.

Michigan Central°—Overnight service with sleepers and coaches. Day service eastbound, but no westbound service entirely in daytime. Standard fare, interchangeable with NYC—but observe that MC uses a different station in Chicago.

Nickel Plate—One night, one day train each way—but westbound day train leaves very early. Sleepers providing night and day services. Diner-lounges are NKP cars, operated by Pullman. Schedules about comparable to regular NYC and MC trains. Differential (lower) fare.

Canadian National‡—Service via Suspension Bridge and Hamilton requires one or two changes. Lehigh Valley or NYC used between Buffalo and Suspension Bridge; or Toronto, Hamilton & Buffalo Line can be used between Buffalo and Hamilton without through fare and without transfer arrangements. Sleepers from Hamilton to Chicago and return on night trains, also coaches; first-class and coach day service with change of cars from Hamilton to Chicago, westbound only; no through day service eastbound; thus, there is a night and a day train west, only a night train east, all on a schedule of about 16 hours. Standard fare.

Erie—One train each way, via Jamestown, with sleeper on main line, Jamestown to Chicago and return; coaches; on overnight schedules of about 17 hours. Differential fares.

Detroit & Cleveland Navigation Company—With steamers between Buffalo and Detroit or Cleveland, accepts railroad tickets between these points.

° NYC and MC permit travel via Cleveland, Toledo, Detroit, and Ann Arbor or via St. Thomas, Detroit, Toledo and Elkhart, on all tickets. MC permits travel via Niagara Falls on all tickets, but this generally means bus from the Falls to Welland. MC has exchange arrangements permitting travel through Hamilton, Ont. All these are at regular fare.

† NYC will sell tickets via Indianapolis ("via Marion and Sidney") at a fare slightly higher than standard, or via Cincinnati at a higher tariff rate. These tickets permit use via more direct routes in one direction, in the case of round-trip tickets.

‡ CN tickets, round-trip, have certain exchange privileges to permit return via Erie or NKP. See agents of CN or Grand Trunk Western.

R. O. Flinn, 814 Liberty Ave., Pittsburgh, Pa.

Thousands of cars are classified daily in both directions in the Enola Yards of the Pennsylvania, across the Susquehanna River from Harrisburg. The busier eastbound yard (left) is car-retarder-equipped. Above is the Harrisburg engine terminal of PRR.

the smoky end. This train begins its run over what is now a part of the Reading Division of the Reading, but was until 1933 the old Harrisburg Division, leading to Lebanon and Reading. It was built as the Lebanon Valley Railroad in 1858.

Other Reading Company passenger service out of Harrisburg consists of two Allentown and Reading local runs, with a mixed train to Gettysburg to complete the picture. Freight definitely holds the center of the stage here, with symbol hotshots converging on the Rutherford yards from the south, where connections with the Western Maryland are made at Gettysburg and at Lurgan, near Shippensburg. Western Maryland train crews operate WM power and crummies into the big Rutherford yard, and Reading crews and power run through to Hagerstown over WM tracks. An operating agreement with the Pennsylvania Railroad also brings Pennsy engines and crews into Rutherford from Hagerstown. In addition, Reading crews are qualified to run to all parts of the Pennsylvania Railroad's Harrisburg yard, and its Mother Hubbards are frequently seen picking up cars as far north as Lucknow. Likewise, a Pennsy shifter may be viewed bucking a draft of cars at Rutherford. Add to this variety the Jersey Central's Pacifics and the Reading's gas-electric train which makes a Harrisburg-Reading round trip every day, and you have quite a show.

Hot rails pour a steady stream of traffic into Rutherford from the Gettysburg & Harrisburg, the Steelton, and the Philadelphia, Harrisburg & Potomac branches. The Gettysburg Branch taps the South Mountain district across the Susquehanna and southwest of Harrisburg, connecting with an offshoot of the Western Maryland at the site of the famous Civil War battlefield. Down the Cumberland Valley, paralleling for a part of the way the route of the never-built but famous South Penn Railroad (most of which is now part of the Harrisburg-Pittsburgh superhighway), the Philadelphia, Harrisburg & Potomac Branch makes its way to Lurgan, where another connection is made with the Western Maryland.

The Reading's Steelton Branch extends downriver to the big plant of the Bethlehem Steel Company at Steelton, and connects with the Steelton & Highspire Railroad, which serves the industry itself.

Little used is the Reading's Schuylkill & Susquehanna Branch, which comes into Harrisburg via the Pennsy tracks from Rockville, on the north. The S&S, which parallels the Williamsport Division of the Pennsylvania Railroad from Dauphin to Rockville, extends north from Dauphin to Pine Grove in the coal regions. It rambles through sparsely settled Stony Creek Valley and provides an alternate route which was at one time a big coal carrier and boasted several passenger trips daily from Harrisburg to Pine Grove and Auburn. The S&S was slated for abandonment until the war changed the picture. Until a few years ago a mixed train was operated each way daily except Sunday.

This service was finally reduced to one round trip a week and then abolished altogether. During the summer months several additional trips were made from Harrisburg to White Springs to serve a Y. M. C. A. camp there. The railroad is the only means of transportation extending all the way through the valley, and only one rough mountain road from the east runs in as far as the camp.

On the west bank of the Susquehanna River, opposite Harrisburg, are the big Enola yards and shops of the Pennsy. Built during the Cassett regime in the early part of the century, they are among the biggest on the system. Extending for five miles along the river, the Enola plant includes the old Marysville yards, once an interchange point between the Pennsy and the Northern Central. Thousands of cars are classified and hundreds of engines are serviced here daily, and as many as 20 yard crews work the maze of tracks at one time.

Almost all classes of freight cars are repaired, rebuilt or built new in the famous Enola car shops. Hundreds of gondolas, box cars, cabin cars and tank cars emerge every month from these shops, which rate next to the famous Altoona shops in importance on the Pennsylvania. A large truck reclamation plant at Lucknow, north of Harrisburg, turns out hundreds of rebuilt trucks for use at Enola. Other facilities include a big waste reclamation plant and an oil filtering plant. The big enginehouse takes care of all classes of steam-engine repairs and most major and minor jobs on the electrics used in freight service.

The final touch to the typical railroad atmosphere here is an old-fashioned railroad "beanery" opposite the brick office where the crew dispatcher and yardmaster hold forth. Here, at all hours of the day and night, crews gather in the spacious dining room to enjoy man-sized portions of food and to talk shop. Plenty of rocking chairs and benches on the big front porch provide an excellent roost for the men awaiting call or resting between runs, and a splendid view can be had of the east-

Collection of Hugh G. Boutell, 1832 Jefferson Pl., Washington 6, D. C.

Eight-Wheeler No. 568 leads the Pennsylvania Limited over the old iron truss bridge which was predecessor to the present four-track stone arch bridge across the Susquehanna River at Rockville, just above Harrisburg. The time is 1892.

bound hump and a portion of the yards. Railroad pictures adorn the walls of the eating room, and the constant rattle of dishes and silver mingling with the banter between waitresses and railroad men make it a place of joy for every railfan to visit.

Picture subject of many artists is the Pennsy's 40-year-old Rockville Bridge, the largest and widest stone arch bridge in the world. It spans the Susquehanna at a gap in the mountains north of Harrisburg and carries the four-track Middle Division, main line to the west. The walls of many a Harrisburg home boast a picture of the bridge, which has graced the Pennsy's calendars a number of times and provided a background for parts of a famous movie production, "Broadway Limited." Picture postcards of that famous train swinging around the curve at the west end of the bridge were popular many years ago, and souvenir pieces on sale in Harrisburg bear its likeness.

Two modern double-track concrete arch bridges carry the tracks of the Pennsy and the Reading across the river at Harrisburg proper, and several piers of the never-built South Penn bridge are also seen here. Above Marysville yards are remains of a relic of Northern Central days: several parts of stone piers and abutments of a bridge that once carried NC tracks across the river to Dauphin. This structure, a covered affair, became obsolete in the early 1880's and was finally abandoned, the Northern Central trains using the Pennsy's forerunner (photo above) of the present stone bridge at Rockville.

The present high pitch of activity recalls wartime periods of the past when local facilities were taxed to their utmost. Tales of those days are still related by members of the Link and Pin Club, an organization of old-timers who

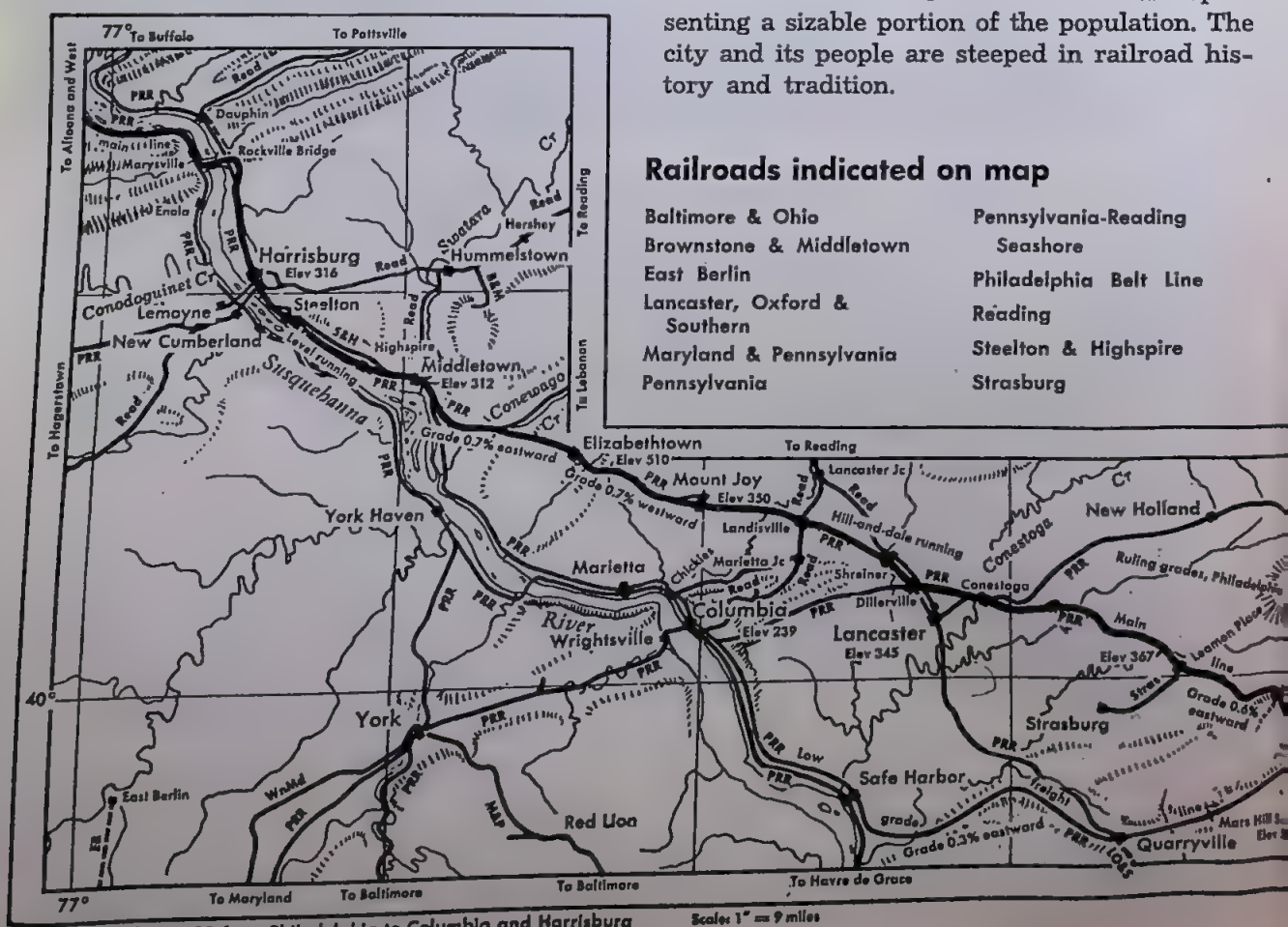
gather regularly in headquarters in the old Pennsylvania Railroad Maclay Street station where, close beside the tracks, they watch the hotshots roar by and the yard goats busy on adjacent tracks. One of the favorite yarns concerns the adventures of Ephriam Jones, a Pennsy engineer who died in retirement several years ago at the age of 95.

Jones began his railroading career in 1855 and was the first man to operate a shifting-engine at Harrisburg. The engine, built by Mathias Baldwin and designed to replace horses then being used, had a flexible frame and jointed driving rods to enable it to negotiate the very sharp curves leading into warehouses built along the banks of the old Pennsylvania Canal.

During Civil War days, after serving in the State Guard and participating in several battles, Jones returned to the railroad and operated engines in ammunition train service. He lived on his engine for weeks at a time. On one occasion he saved the lives of Union General McClellan and his staff by refusing to pull out of a sidetrack without orders from his dispatcher, thus averting a head-on collision with a hospital train. Another time, he was rolling southward near Hagerstown with a supply train for the advancing Union Army. Somehow he got ahead of the soldiers and steamed right into an enemy camp. But before the Confederates could recover from their surprise and capture the train and its crew, the boys in blue came whooping down the hill and dispersed them.

During the Spanish-American War, Jones ran troop and ammunition trains to Camp Meade, near Harrisburg, and was finally retired from active service in 1905, after 50 years in Pennsylvania Railroad engine cabs.

DESPITE the fact that it is highly industrialized and a great political center, Harrisburg is essentially a railroad town. Housed in the Pennsy's big rambling station are the headquarters of the Philadelphia Division, Eastern Region officials and other divisional employees. The Reading Company maintains a large personnel in its own terminal building and various offices in and about the city. Thousands of the men who swing scoops, pull throttles, pass signals and perform the multitude of other railroad duties are of old-line railroad families representing a sizable portion of the population. The city and its people are steeped in railroad history and tradition.



Map of Pennsylvania RR from Philadelphia to Columbia and Harrisburg

Scale: 1" = 9 miles

Railroads indicated on map

- Baltimore & Ohio
- Brownstone & Middletown
- East Berlin
- Lancaster, Oxford & Southern
- Maryland & Pennsylvania
- Pennsylvania
- Pennsylvania-Reading Seashore
- Philadelphia Belt Line
- Reading
- Steelton & Highspire
- Strasburg

And Still the Hens Are Laying

BY WILLIAM MOEDINGER JR.

Pennsylvania farmers in 1828 opposed building Philadelphia & Columbia, now a vital part of the Pennsylvania Railroad's bustling main line.

William Moedinger Jr., 125 E. Vine St., Lancaster, Pa.

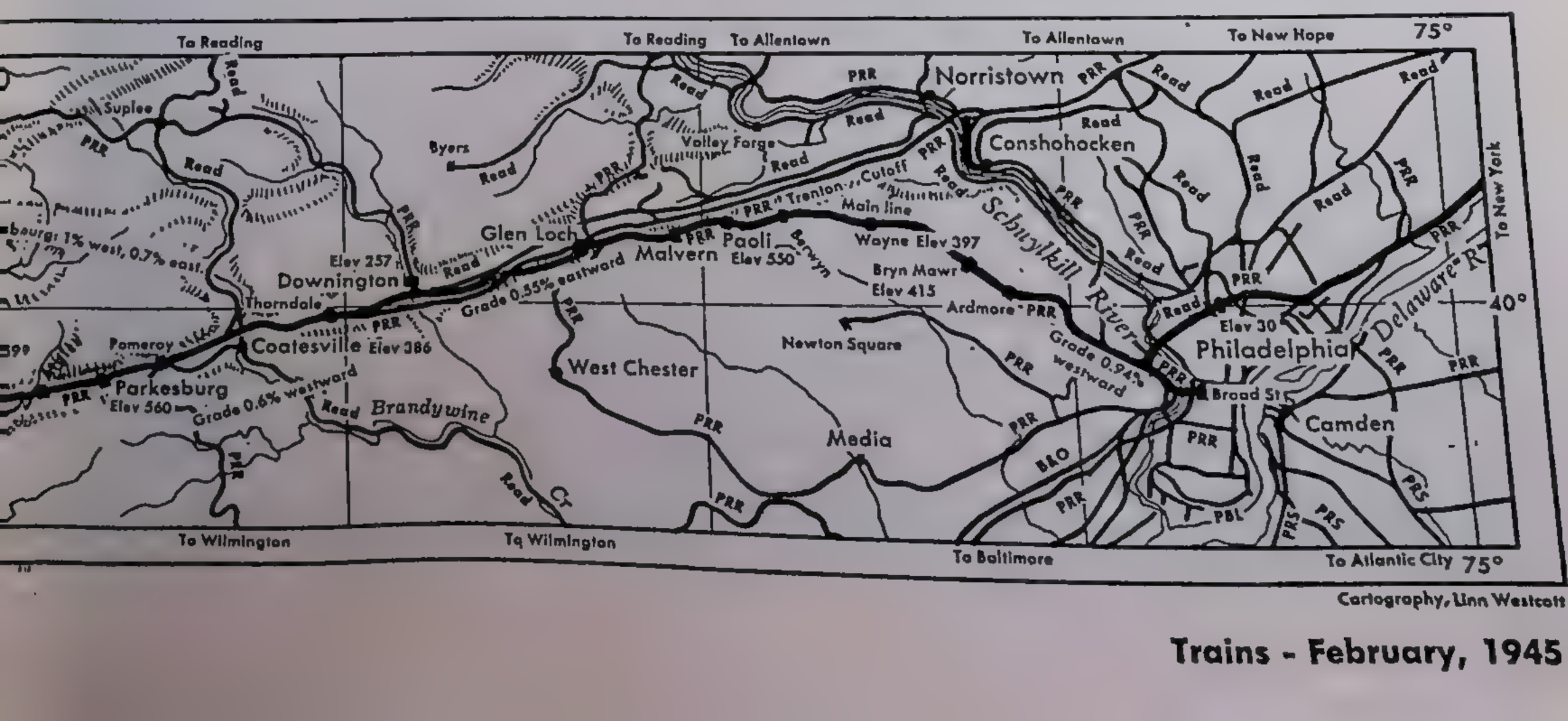
A GG-1 motor running light between Lancaster and Columbia.

THE problems of poultry husbandry seldom are recognized as phases of railroading. Yet the lowly, cackling barnyard fowl, unknowingly abetted by the cud-chewing bovine, was responsible, in a way, for locating a substantial portion of one of America's oldest railroads, the 81-mile Philadelphia & Columbia, now part of the Pennsylvania Railroad.

For an unbiased version of this story, which we may find verified in early records of the Pennsylvania State Legislature, we must go back 117 years to early 1828, when the politicians were wrangling over a bill to empower the state to construct and operate this railroad.

These savants had learned the hard way, by trial and error, that a canal between Philadelphia and Columbia was impracticable. The only alternative was to construct a railroad. But despite the urgency of completing the project in order to render the canal system to the west useful, the legislators were divided on whether or not to risk the public's money and their own reputations on such a wild scheme. When the bill came to vote, the commercial and industrial interests voted "aye," while the rural and farming blocs expressed their sympathies with an unyielding "nay." A tie resulted. When it was discovered that one member had not voted, both sides inaugurated an intensive campaign to win his vote.

Fundamentally, this particular legislator leaned in favor of the railroad; but he cun-



Cartography, Linn Westcott

ningly feigned sympathy for the farm interests, who averred the proposed railroad surely would cause the hens to stop laying and, quite likely, the cows to stop giving milk. Subtly he let the proponents of the bill know that his vote could be had for a "slight concession." All he asked, was that the legislature incorporate into the bill a clause requiring all passenger trains to stop in front of the old General Wayne Inn, which stood overlooking the lush Chester Valley near the present site of Paoli. When proponents winced, "No stop, no aye" was his ultimatum. Unreasonable as it appears, his demand becomes even more so when it is realized that the inn wasn't located near the route of the proposed railroad.

Proponents of the bill finally won his vote by making the concession, which necessitated changing the entire route east of Downington. Instead of following, as originally planned, a gentle downgrade along the floor of the Chester Valley to the Schuylkill River, thence along a natural water-level route to Philadelphia, builders of the P&C were forced to lay the rails up the sides of the hills bounding the southern side of the fertile Chester Valley, breast the summit of the green Eastern Hills at Paoli, and descend a heavy grade in the remaining 20 miles to tidewater.

The hold-out politician was, of course, the proprietor of the old General Wayne Inn; and the practice of stopping all passenger trains here continued not only during the life of the P&C, but for many years after its 81 miles had become a part of the present Pennsylvania Railroad system. And while the Pennsylvania no longer is bound by the provisions of this bill so that travel-worn passengers of 50-odd passenger trains might refresh themselves at the inn with a few pretzels, hard-boiled eggs, sandwiches, or mugs of beer, and at the same time enable the poor innkeeper to keep the sheriff away, a repenting legislature has found no laws to ease the grades to Paoli town.

The legislature having passed the bill, the state now faced the task of resurveying and constructing the railroad. The final surveying commenced immediately; and this preliminary job was completed with inordinate haste. Performed by private firms and individuals, it was subjected to constant state interference. The business of railroad surveying was too young to furnish men experienced in this particular field, yet these men, by virtue of past experience in general surveying, coupled with ordinary "horse sense," knew that the railroad should have as few curves as possible. The state, however, was completely oblivious to the original cost and subsequent operating problems of curves. The important thing, in the opinion of the canal commissioners, who were in charge of the railroad, was that no fills should exceed a height of six feet. A higher fill was considered definitely unsafe. Therefore, the road had to follow the topographical pattern of the land. For example, between Lancaster and Columbia, a 10-mile stretch which today is the only portion of the old P&C not forming a part of the main line of the Philadelphia Division, a half-dozen curves of very moderate curvature would have sufficed. The ukase of the state, however, dictated one reverse curve after another—nine-degree curves at that.

In other respects the politicians showed uncanny regard for the citizens' dollar. Quite willing to spend any amount of money for extra thousands of feet of curved rails (which, because rail-bending was unheard of at that time, had to be imported from England formed to the exact degree of curvature required), they deemed it wise, for the sake of saving 1½ miles of track, to by-pass the largest on-line town, Lancaster. The Canal Commissioners soon changed their minds about this item of economy, and this bustling community of 8000 was on the main line of the P&C when it was completed.

A major feat was the actual construction of these 81 miles. In addition to spanning two deep valleys—the Brandywine at Coatesville and the Conestoga just east of Lancaster—a number of deep cuts had to be pierced, of which the 35-foot-deep cut through Mine Ridge at Gap was the most formidable. The obstacle of elevation required an inclined plane at each end of the line. The Schuylkill Plane at Philadelphia was 2714 feet long and descended 180 feet, while the plane at Columbia dropped 90 feet in a distance of 1914 feet. Except for not-too-frequent turnouts, the entire line consisted of a single track laid with "edge rails," which, in contrast to the "plate rails" on contemporary roads, required the wheels of rolling stock to be fitted with flanges. Rails were laid in three ways: Six miles were laid on longitudinal granite sills measuring approximately 18 inches square by 5 feet long. Eighteen miles utilized wood in place of the granite sills. The remaining 57 miles rested on

18-inch-square granite blocks. None of the methods employed any cross-ties. Every foot of rail was imported from England, in sections 9 to 15 feet long.

By the end of 1829 nearly 40 miles of railroad were in operation, and as construction progressed operation was extended to the finished sections. On April 16, 1834, as the eastern link in the state's Philadelphia - Pittsburgh transportation project, the Philadelphia & Columbia Railroad was opened officially to through traffic.

Operation of the P&C is without question the stellar phase in state ownership. It's a story that lasts for 23 years, until August 1, 1857, when the Pennsylvania Railroad purchased it, together with the canal system west of Columbia, for $7,500,000.

Through the entire period of construction, as well as after the line had been finished but prior to the official opening, horses provided the motive power exclusively. Because the railroad was built with public funds, the legislators declared it should be open to any Tom, Dick, or Harry who owned anything vaguely resembling a four-legged beast of burden, a vehicle fitted with flanged wheels, and the wherewithal to pay toll. Despite a toll of four cents per ton-mile, the railroad did a big business. Basically, it was operated like the toll roads in the early days of the automobile, or not unlike Pennsylvania's superhighway between Harrisburg and Pittsburgh.

The tollhouse keeper was, of course, a man who stood within the good graces of the particular political party in power. Holding so coveted a job, he was the object of much public criticism; but everyone, at least everyone who had occasion to use the railroad, was careful to retain his good will. In addition to collecting the toll from each driver, he was also charged with the responsibility of determining the weight of each vehicle using the tracks of the P&C. Since track scales were not among the facilities offered the public, his judgment reigned supreme; and shipment by rail could be a very expensive proposition if the tollhouse keeper didn't consider you one of his friends.

A drive over the meandering P&C was an adventure and without peer in the history of transportation. The tollhouse keeper and driver alike were not burdened with such modern complexities as the telephone, telegraph, or signals. Once he had paid his toll, the driver could continue on his way virtually without interference from the railroad. The experienced driver would embark upon his journey to the next tollhouse, which also marked the next

The Pennsylvania Limited rounds a curve on the Philadelphia Division, near Merion, Pa., hauled by a Class D-16a locomotive, No. 296, a 4-4-0. This photograph was taken in 1899.

Pennsylvania Railroad.

turnout, at a very slow pace. As the journey progressed he would gradually increase his pace, fairly racing across the last mile to the locust post which marked the halfway point between turnouts. The theory of driving slow at first was practiced so that a driver meeting an oncoming vehicle shortly after leaving the tollhouse would not have so far to back up, while recklessly fast driving over the last mile to the center post was thought to be the best insurance against having to back too far. According to law, the driver who reached the center post first had the right of way to the next tollhouse, and all oncoming drivers encountered thereafter were forced to back up.

Quite a few of the posts were located either right on a curve or at the end of one, so it is not difficult to imagine what happened when two racing drivers approached the center post at the same time. Torn between stopping their vehicles to prevent a head-on collision and continuing so as to get their steeds' necks across the line, anything was likely to happen. Many times both drivers would halt their vehicles for safety's sake, but for hours afterwards the railroad would be blocked while these two argued who should do the backing. The remedy was for the superintendent to appear on the scene, decide who should back up, and then take the offenders to the nearest squire and have them "nominally" fined. Not infrequently opposing traffic would meet forcibly with fatal casualties to the motive power thus involved. The procedure then was for each driver to pick himself up, if he hadn't met the same fate as his motive power, and use a bit of forceful persuasion on his opponent.

As the link in the trans-Pennsylvania transportation system, the state was banking on something more powerful and enduring than horses. In 1833, from Matthias W. Baldwin, the same Philadelphia jeweler who had constructed the steam locomotive *Old Ironsides* for the Philadelphia, Germantown & Norristown Railroad, the canal commissioners ordered three locomotives to be delivered to the P&C. Two of these locomotives, as far as can be determined, were ready for service when the road was officially opened for traffic in 1834, while it has been verified that one of them, the *Black Hawk,* on that memorable April 16, pulled coaches from Lancaster to Philadelphia carrying homeward-bound members of the legislature who had left Harrisburg the night before on the towboats.

With the state now furnishing motive power, various individuals and firms began to furnish cars and coaches for freight and passenger service between terminals. One of these, the People's Daily Line, operated by the partnership of Osburn, David, Kitch & Scholfield, advertised regularly in the numerous weeklies along the line. Their coach, so the advertisements read, left the corner of Broad and Vine streets, Philadelphia, daily at 8 a. m., and arrived in Lancaster—Providence permitting—at 4 p. m., Columbia, 5:30 p. m. Another coach on a very similar schedule operated in the opposite direction. The prospective traveler was also advised that "in wet weather horses will replace the steam engine."

Even before the advent of steam, and that was before the railroad was officially opened, the state realized the inadequacy of the single track. By late 1834, well within a year after the road had been officially opened, a second track had been completed. The P&C, in addition to being the first railroad in all the world to be built and operated by any government, now claimed another distinction—that of being the world's first double-track railroad. Employing all of the stupendous pageantry known to modern advertising technique, the state heralded the opening of the second track by running two steam trains abreast, each with a string of tiny cars, from one end of the line to the other.

But, alas, the legislators were not permitted to revel long over their prodigy, for the introduction of steam and the increase in traffic stemming from the completion of the second track produced new headaches for them. Early spring, with its thaws, was playing havoc with the tieless track, sometimes derailing whole trains, damaging the lading and putting nasty scratches on the much-pampered iron horse. The steam locomotive itself was fostering another issue which the legislators found difficult to hedge and still retain the confidence of the voters. Big shippers and commercial interests in general demanded that the horse be barred from the tracks of the P&C. Farmers and others with their own vehicles—the same ones who fought the railroad in the beginning—claimed the use of the horse on its tracks was necessary to their very existence. If they could not use the railroad to drive to market, their produce would rot in the fields for lack of a market and the city folks would go hungry.

For two years the horse-steam harangue continued. For two years the panting steam loco-

motive implacably followed the creaking, poking, dobbin-drawn cars of taxpayers who "knew their rights." The horse-steam issue became the topic of every political speech. The Democrats, who were in power at the time, refused to rule the horse off the railroad lest they lose the rural vote. The opposing party, definitely in the minority, refused, on the other hand, to vote for the steam authorization bill because it didn't want to see the power of the Democratic party enhanced by control over motive power on the 81-mile railroad.

Meanwhile the state undertook a comprehensive program of track rehabilitation. With better track, public opinion began to see the potentialities of the steam locomotive. Given a clear track, Baldwin's "instruments of the Devil" were setting records. When passengers and wares arrived late, people along the line knew there must have been a horse-drawn vehicle ahead of the train somewhere along the line. Fortunately for the steam advocates, many horse drivers refused to hurry their steeds when the steam train caught up with them. In fact, many of them deliberately held their horses in check to prove that they had just as much right to the rails as anyone else. Public opinion was crystallizing enough so that in 1836 the legislature passed the bill authorizing the state to own and operate all motive power on the P&C as well as on the Portage Railroad.

The little town of Parkesburg, 44 miles west of Philadelphia, because of its location about midway between terminals, was chosen for the main shops of the P&C; and as soon as the railroad acquired enough steam locomotives to meet the ever-growing traffic, old dobbin was barred from the tracks. Despite the state, the P&C was beginning to acquire at least some resemblance to a railroad. Tollhouses became full-fledged stations. Tollhouse keepers, by a single stroke of the pen, evolved into the most respected personages in their respective communities. Train schedules were transformed from possibilities to probabilities. Save for a negligible roster of maintenance equipment, the state owned no rolling stock. This was left up to the shipper and traveler.

A detailed look at cars and coaches of the P&C during the ensuing decade would undoubtedly provide more than enough material for a full issue of TRAINS, but it is interesting to steal a glance at a typical train of the period. Standardization, especially during the earlier years, was unheard of. The great railroad car

William Moedinger Jr.

Hardy stone arch bridges and culverts dating from the original construction still dot the old P&C right of way.

building plants in the commonwealth were not even dreamed of then. All freight cars and passenger coaches were constructed for their individual owners by whatever wagon builder they chose. Each builder fashioned the cars after his own predetermined standards. In the vocabulary of these craftsmen, standardization applied only to the spacing of the wheels. P&C trainmen had to possess the versatility of inventors merely to couple cars of one wagon builder with those of another. The height, width, length, and general shape of the cars were restricted only by existing clearances and the individual genius of the builders. A typical passenger coach of the day would probably look something like a cross between a stage coach, a giant cheese box, and a canal boat. If such is possible, the typical freight train presented even more of a hybridity.

Most ingenious of all, perhaps, were the canalboat cars operated by a firm whose sphere of operation extended the whole way from Philadelphia to Pittsburgh. This enterprising firm rigged up two flat cars with cradles to fit the bottoms of canal boats. Since one towboat was too long for one car, the boats them-

Courtesy Pennsylvania Railroad.

Section of canal boat moving through Philadelphia.

selves were cut into two sections, each section resting snugly on one car. Upon reaching Columbia, the two cars bearing the canalboat sections were eased right into the water of the canal basin there, whereupon the towboat sections floated off their cradles and were bolted together for the tow to Hollidaysburg. Here the procedure was reversed, while at the western end of the Portage Railroad a repetition of the job at Columbia occurred. For a while this seemed to be the solution to the costly transfer task at the three rail-canal junctions, but the huge towboats were soon found to be too cumbersome and ungainly for the tiny cars and light rails of the two railroads.

As a railroad the P&C had proved its worth. Despite severe growing pains, it could be described as entirely successful. What's more, it was the only link in the trans-Pennsylvania transportation system that was withstanding the acid test of traffic. The slow canal system to the west had failed under actual traffic conditions. Canal maintenance costs far exceeded traffic revenues. Most annoying was the fact that the canals were frozen shut from late fall until early spring. Through shippers were diverting their traffic away from the canals, primarily because of the interchange expense. The legislators found themselves nursing a new headache: how to satisfy the growing clamor for a trans-state railroad without sacrificing the most expensive ditches the world had ever seen. To build a railroad paralleling the canal would be to compete with themselves, to have two appalling deficits instead of one. Again public opinion came to the rescue, and a feeble little company called the Pennsylvania Railroad was issued a charter to link Harrisburg with Pittsburgh.

The story from here on is one of the superiority of private enterprise over and above state ownership. It's the story of honest citizens banded together with a twofold purpose in mind: making money and performing a public service so as to prove beneficial to owners and the transportation-buying public alike.

Aggressively and sagaciously, the infant Pennsylvania Railroad immediately negotiated trackage rights with not only the P&C but with the Harrisburg, Portsmouth, Mount Joy & Lancaster Railroad, whose 36 miles of single track provided the bridge railroad between the Pennsylvania at Harrisburg and the P&C at Lancaster. As rapidly as Pennsylvania tracks thrust westward, they enjoyed the lucrative traffic from the Philadelphia area. And brighter too were the tracks of the P&C. But while interchange with the growing Pennsylvania line reflected advantageously on the P&C's profit and loss account, its effect on the state-owned canal system was just the opposite. Moreover, the over-all effect on the state rail-canal system was disheartening. Increasingly precarious became the position of the state system as the Pennsylvania stretched through the mountains and toward Pittsburgh. With the passing of the weeks it became apparent that the state could not sustain the mounting losses indefinitely. The treasury was staggering and the tax-burdened citizens were squirming. Legislative decision to offer the entire rail-canal system to the highest bidder brought a bid of $7,500,000 from the Pennsylvania Railroad. The deal was consummated, and the world's first experiment in government-owned and -operated railroads came under the wing of progressive private enterprise.

Nominally, the Philadelphia & Columbia Railroad is today but a mere ghost. Actually, though altered and improved beyond recognition, it carries on. Improved alignment has reduced the original 81 miles to 79. Four scrawny ribbons of iron have spread into eight meticulously ballasted bands of 130- to 152-pound steel. A schedule of 14 weekly passenger trains has expanded to somewhere around 400. Except for the 10-mile sector between Lancaster and Columbia, this railroad is an integral part of the Pennsylvania's main artery to the west. As a matter of fact, even these 10 miles serve the Pennsylvania in the same capacity for through freight traffic. Passenger service over this section of the line is confined to a handful of local passenger trains of the gas-electric and mixed-steam varieties.

From the lush, green pastures which edge up to the very bases of stately, silvery uprights flanking the right of way, the great-great-great grandchildren of old dobbin watch humming GG-1 electrics whisk their bright flashes of tuscan red through the rolling hills at 70 miles an hour. Tillers of the soil pause behind the plow to watch hundred-car freights roll by, passenger-paced by double-headed P-5a electrics. Today's cavalcade of commerce is a veritable object of wonderment to man and beast alike, to every living thing save one. Only our feathery friend of the barnyard goes right on about her menial task, neither pleased nor displeased.

The Jointed-Boiler Locomotives

Santa Fe Mallets bent around curves much more easily than conventional articulateds. A photo sequence

SOME of the most unusual locomotives this country has ever seen went into service on the Santa Fe Railway some 35 years ago. They were articulated Mallet locomotives with joints in the middles of their boilers so they could more easily negotiate curves! The Santa Fe received its first Mallet locomotives in 1909 from Baldwin Locomotive Works. The overhang of the front end of the boiler, shown clearly in one of the photos on the following pages. started the road thinking about boilers which would bend around curves along the wheelbase.

Of course the entire boiler was not the boiler as we commonly know it. A joint in the middle of a locomotive boiler would be almost unthinkable. But there was a division of labor between two units connected by various steam and water pipes fitted with flexible joints. The articulated boilers were in fact divided by pressure-tight transverse partitions into compartments which were arranged to serve as:

(a) Steam generating section.
(b) Superheater (smoke-tube type).
(c) Reheater (smoke-tube type).
(d) Feedwater heater.

The location and amount of space allocated to each of these various features in the boiler was not exactly the same in all of the locomotives illustrated, but the following description is typical:

The rear end of the boiler (back of the flexible joint) contained the steam generating section, composed of the usual locomotive firebox and flues, and also the superheater and a short gas chamber intervening between the steam generating section and the superheater.

The forward unit (ahead of the flexible joint) contained the reheater, feedwater heater, and smoke box, with a short gas chamber intervening between the reheater and feedwater heater. The reheater was located at the rear end of this unit. The steam generating section and feedwater heater were in open communication with each other through the pipes and contained water and steam at boiler pressure, 220 pounds per square inch maximum. The superheater contained steam at the varying pressures prevailing in the valve chambers of the high-pressure cylinders, these pressures being controlled and regulated by the locomotive throttle.

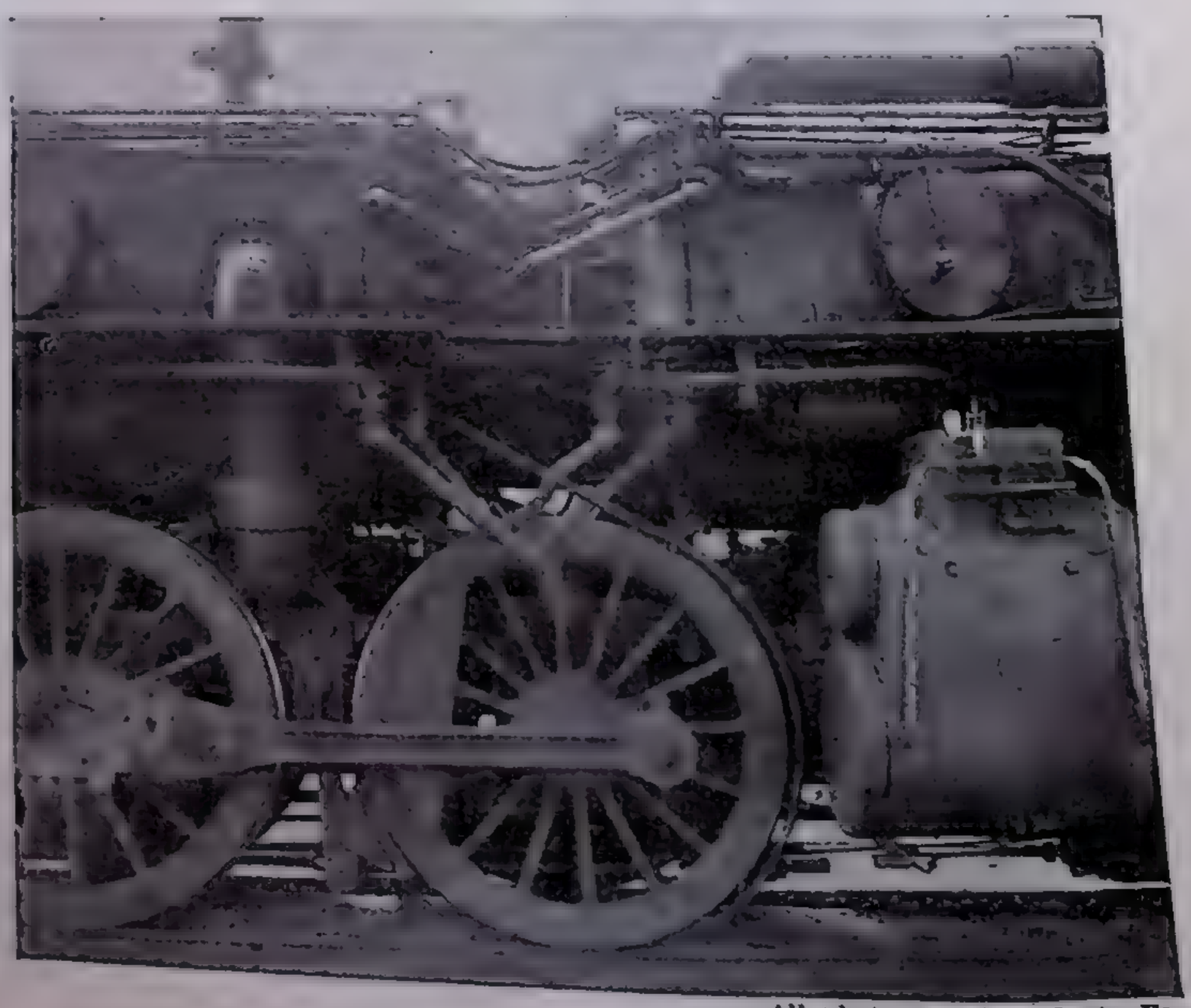
The reheater received steam exhausted from the high-pressure cylinders and served as a receiver through which this steam passed en route from the high-pressure to the low-pressure cylinders. The pressures prevailing in the reheater were a little less than one-half those in the superheater and high-pressure steam chests, that is, 80 to 100 pounds maximum.

The superheater, reheater, and feedwater heater were all made to contain as many small flues as could be applied to them. The products of combustion, after passing through the flues of the steam generating section, were passed through these small flues in the superheater, reheater, and feedwater heater, and the flues of these appliances were surrounded by steam or water so as to promote maximum absorption of heat from the gases passing through the flues.

The space enclosed within the flexible joint served as a gas chamber between the superheater and reheater. This space contained only products of combustion at or slightly below atmospheric pressure.

As compared with modern superheaters and feedwater heaters, the heat absorption effected by these appliances on the Mallet locomotives was quite low. The maintenance of these appliances, on the other hand, was a very considerable item, and eventually meant their downfall.

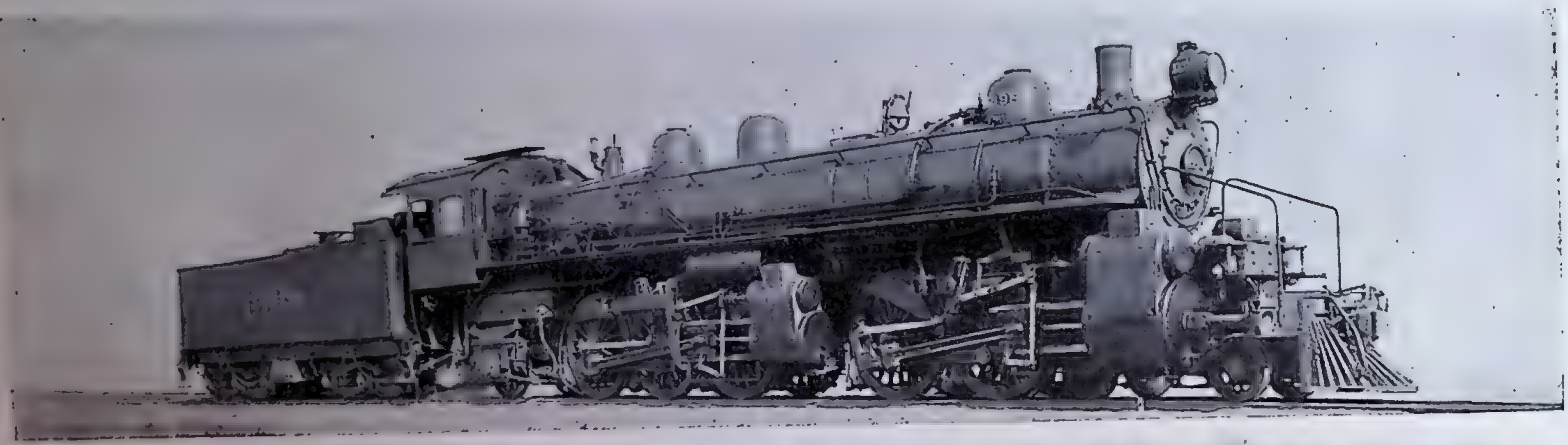
Close-up of the ball joint in flexible boiler of Engine 3322. This type of joint gave acceptable service throughout 15 to 18 years of service.



All photos courtesy Santa Fe.

These photos tell the story of Mallet articulated locomotives on the Santa Fe Railway. The first Mallet compound locomotives to be acquired by the Santa Fe were Nos. 1700 and 1701, received from Baldwin Locomotive Works in 1909. Both locomotives were rebuilt into simple engines of the Mikado type in 1924 and are now Nos. 1798 and 1799.

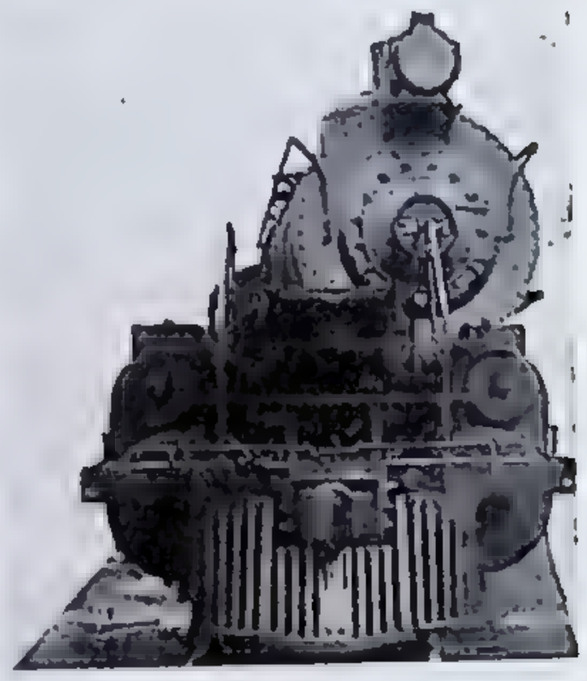
Below is Engine 1398, 4-4-6-2 Mallet compound. Two locomotives of this design were received from the Baldwin Locomotive Works in 1909. They represent the first and, so far as is known, the only attempt to adapt the Mallet compound design to high-speed passenger service. Their driving wheels were 73″ in diameter. Both locomotives were rebuilt in 1915 into simple locomotives of the Pacific type and are still in service. Their present numbers are 1398 and 1399.



Engine 3000, 2-10-10-2 Mallet compound. This locomotive with rigid boiler was assembled at Topeka Shops in 1911.

Cylinders, diameter and stroke, in.	28&38x32
Boiler diameter, in.	78¾
Heating surfaces, sq. ft.:	
Fire box	294.5
Flues	3919.5
Feedwater heater	2659.4
Superheater and reheater	2300.0
Grate area, sq. ft.	81.9
Driving wheels, dia., in.	57
Steam pressure, lbs.	225
Tractive force, lbs.	111,600
Weight on drivers, lbs.	550,000
Total weight, lbs.	616,000
Tender capacity:	
Gallons of water	12,000
Gallons of fuel oil	4000
Over-all length, engine and tender	120'-7 1/16"

Front view of Engine 3004 (3000 class) Mallet compound standing on a curve, showing the relative position assumed by the low-pressure cylinders and front end of the rigid boiler on a sharp curve. The condition illustrated in this photograph prompted consideration of flexible boilers.



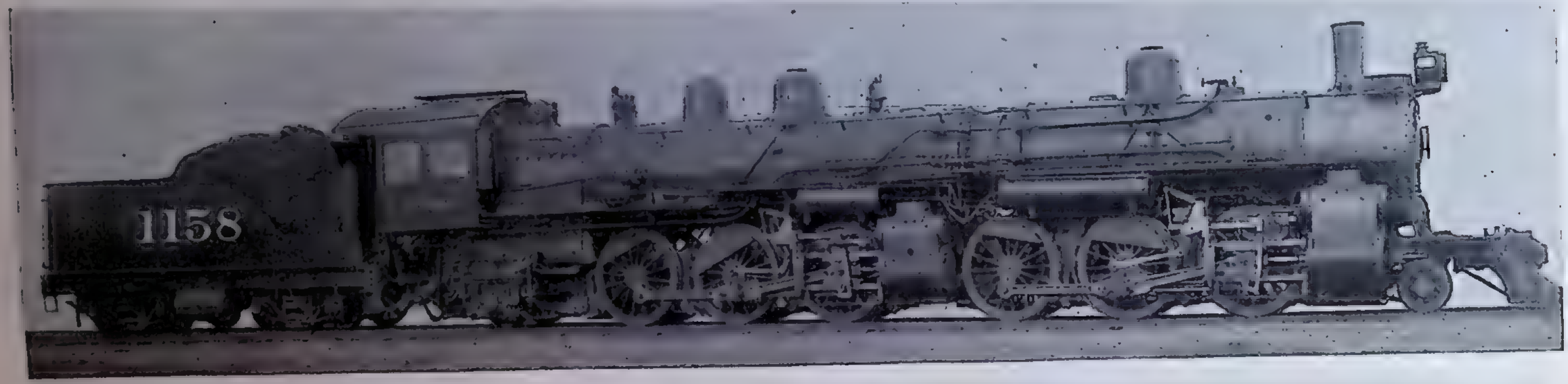
Mallet compound engine No. 3002, showing the manner in which 3000-class Mallets were assembled. The front unit and tender were received new from the Baldwin Locomotive Works; the rear or high-pressure unit of the locomotive was reconstructed from a 900-class 2-10-2 which was modified in Topeka Shops and incorporated into the Mallet locomotive.

Engine 1157, 2-6-6-2 Mallet compound locomotive with flexible boiler. Ball joint, AT&SF design. Assembled at Topeka Shops in 1910.

Cylinders, diameter and stroke, in.	24&38x28
Boiler diameter, in.	74 1/16
Heating surfaces, sq. ft.:	
Fire box	195
Flues	3543
Feedwater heater	2174
Superheater and reheater	1083
Grate area, sq. ft.	53.5
Driving wheels, diameter, in.	69
Steam pressure, lbs.	220
Tractive force, lbs.	62,400
Weight on drivers, lbs.	304,300
Total weight, lbs.	370,200
Tender capacity: Gallons of water	9000
Tons of coal	14
Over-all length, engine and tender	100'-11 1/4"

Engine 1158, 2-6-6-2 Mallet compound with flexible boiler and ball joint. Received from Baldwin Locomotive Works in 1910.

Cylinders, diameter and stroke, in.	24&38x28
Boiler diameter, in.	70
Heating surfaces, sq. ft.:	
Fire box	202
Flues	3375
Feedwater heater	1516
Superheater and reheater	1109
Grate area, sq. ft.	52.5
Driving wheels, diameter, in.	69
Steam pressure, lbs.	220
Tractive force, lbs.	62,400
Weight on drivers, lbs.	295,500
Total weight, lbs.	365,900
Tender capacity: Gallons of water	9000
Tons of coal	12
Over-all length, engine and tender	101'-9 3/8"

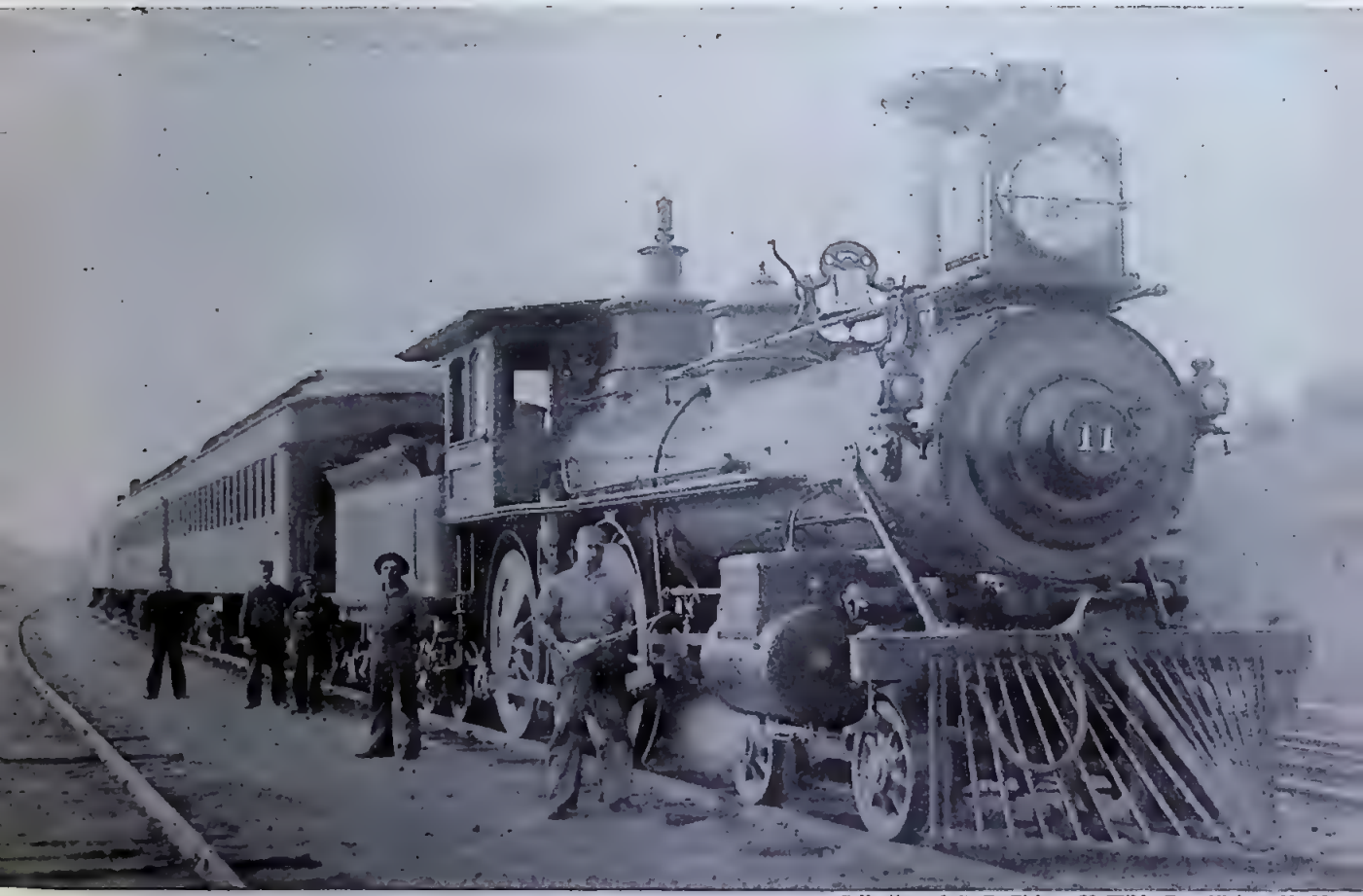


Engine 3321, 2-6-6-2 Mallet compound with flexible boiler. Accordion joint (later, ball joint). Received from Baldwin Locomotive Works in 1911.

Cylinders, diameter and stroke, in.	24&38x28
Boiler diameter, in.	70
Heating Surfaces, sq. ft.:	
Fire box	234
Flues	3330
Feedwater heater	1550
Superheater and reheater	901
Grate area, sq. ft.	63.4
Driving wheels, diameter, in.	69
Steam pressure, lbs.	220
Weight on drivers, lbs.	315,300
Total weight, lbs.	381,800
Tractive force, lbs.	66,400
Tender capacity: Gallons of water	9000
Tons of coal	12
Over-all length, engine and tender	101'-8⅞"

Engine 3322, 2-6-6-2 Mallet compound with flexible boiler and ball joint. Received from Baldwin Locomotive Works in 1911.

Cylinders, diameter and stroke, in.	24&38x28
Boiler diameter, in.	70
Heating surfaces: sq. ft.:	
Fire box	213
Flues	3476
Feedwater heater	1446.3
Superheater and reheater	974.8
Grate area, sq. ft.	63.4
Driving wheels, diameter, in.	69
Steam pressure, lbs.	220
Tractive force, lbs.	62,400
Weight on drivers, lbs.	329,400
Total weight, lbs.	400,800
Tender capacity: Gallons of water	9000
Tons of coal	12
Over-all length, engine and tender	101'-8⅞"

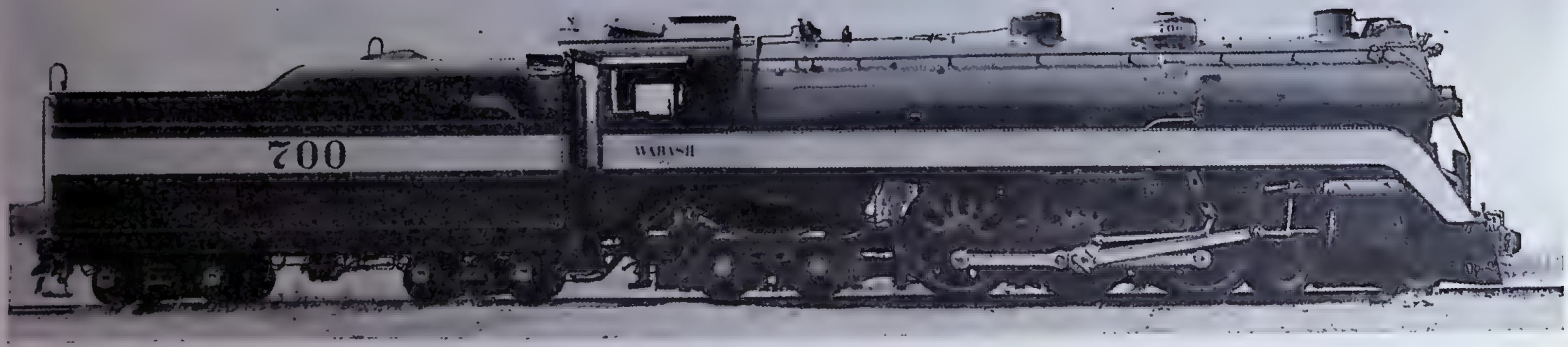


Collection of C. E. Fisher, 20 Wilde Dr., Waban 68, Mass.

William Mason's Last Engine

BY C. E. FISHER

William Mason began building locomotives at Taunton, Mass., in 1853. Thirty-one years later, after he had constructed 713 locomotives, his end came quickly. At the close of 1883 he was building locomotives for the Columbus & Eastern Railroad. Whether the C&E ordered too many and thus strained its financial integrity, I don't know, but the last engine was not delivered. The Old Colony Railroad accepted the engine and it was placed in the Taunton enginehouse. A short time later a messenger arrived at the Mason works, for in the rush it had been overlooked that the C&E used vacuum brakes while the OC used Westinghouse air brakes. Mason sent a gang of men over to change the brakes and he followed later. The OC wanted the engine in a hurry; Mason threw off his coat and helped, worked up a sweat, suffered a chill, and in a couple of weeks was dead of double pneumonia—a great loss to the community and the country in general. OC No. 11, above, was the locomotive that cost Mason his life.



New Locomotives for Old

THE Wabash has converted five three-cylinder Mikado freight locomotives, not suitable for present-day freight train operating speeds, into modern Hudson-type locomotives suitable for heavy passenger and fast freight service. The boilers and cabs of the Mikados were used practically as they were, but modernized with new details and economy appliances. A new one-piece cast-steel frame casting was applied.

The boilers from the ex-Mikes have a steam generating capacity 48 per cent greater than the Class J-1 Wabash Pacifics. These new P-1 Hudsons have 80-inch drivers, compared to 74-inch on the Pacifics and 64-inch on the same engines when they were Mikados. Former engine numbers were 2600 to 2604; present numbers are 700 to 704.

Forty-five two-cylinder Mikados, otherwise similar to the five three-cylinder jobs which have been converted, are still in freight service. Principal use for the Hudsons is on heavy overnight Detroit-St. Louis trains, as well as in the fast St. Louis - Kansas City service, on troop trains, and to a considerable extent on fast freights.

The new locos are equipped with roller bearings on all engine wheels, and are carefully cross - counterbalanced to reduce the dynamic augment (vertical pound due to the revolving counterweights) at high speed. The body of the locomotive and tender, driving wheels, and running gear are painted a deep blue. The skirt and band on the tender are painted aluminum white, edged at top and bottom with a one-inch red stripe. Lettering and numbering are in blue. Rods and motion parts are polished.

Principal Dimensions

Comparing the new Class P-1 with the original K-5 (three-cylinder) Mikado and a J-1 (4-6-2) passenger locomotive:

	P-1	K-5	J-1
Type	4-6-4	2-8-2	4-6-2
Boiler pressure, lbs.	220	210	215
Cylinders, diameter and stroke, in.	26 x 28	2-23x32 1-23x28	24 x 26
Diameters of drivers, in.	80	64	74
Tractive force, lbs.	44,244	67,869	36,984
Factor of adhesion	4.44	3.76	4.20
Total weight of engine, lbs.	374,680	340 490	248,840
Weight on drivers, lbs.	196,390	251,215	155,140
Wheel base, engine, ft.-in.	40-7	39-1	34-0
Wheel base, engine and tender, ft.-in.	75-5½	73-0½	66-5⅜
Over-all length, ft.-in.	87-5	83-10½	76-7⅜
Tender capacity:			
Tons of coal	16	18	11½
Gallons of water	12,000	10,000	8800
Boiler dia., 1st course inside, in.	88	88	68⅜
Firebox length, inside, in.	121 $\frac{3}{16}$	121 $\frac{7}{8}$	108⅛
Firebox width, inside, in.	84¼	84¼	84¼
Grate area, sq. ft.	70.0	70.9	63
Evaporative heating surface, sq. ft.	4225	4225	3310
Superheater heating surface, sq. ft.	1051	1051	740
Piston valve diameter, in.	12	12	12
Valve travel, in.	8	6½	6½

Sgt. Roger Borrup.

German track destroyer, used behind last train as troops retreat. It cuts ties and twists rails.

How Steep Is Up?

Railroad trains, because of the easy rolling friction of steel wheels on steel rails, are powered very efficiently compared with the overpowering of the usual automobile or truck. A 5000-ton freight train may be pulled by a 5400-horsepower Diesel locomotive, while a 1½-ton automobile may have 100 horsepower under the hood. For this reason slight grades make much more difference to railroad operation than they do in driving the family juggernaut.

Railroad grades are measured in percentage, a 1 per cent grade being one which rises 1 foot in a length of 100 feet. A 1 per cent grade is hardly perceptible to the eye, but for ordinary main line, except in mountain territory, it is quite steep. Mountain grades more usually run up to as much as 2 per cent and on some lines they may go as high as 4 per cent. The steepest mainline grade in the country is 4.7 per cent on the Southern Railway, between Columbia, S. C., and Asheville, N. C.

You can't just look at a railroad grade and judge its steepness, but with the aid of a hand level you can make a pretty close approximation. Measure your height to eye level, stand on the track and sight out across the hand level, noting where your level line of vision intersects the track. Measure the distance of this point and divide it into your height to eye level. The result is the per cent of grade. For instance, if your height to eye level is five feet and the hand level projects your line of vision to a distance of 250 feet, the grade is 5/250, or 2 per cent.

Small-Town Station

For sheer rural elegance in depot design and gardening it would be hard to beat this Whippany (N. J.) station on the Morristown & Erie, 12-mile freight line between Morristown and Essex Fells. Not only is the field-stone structure designed along the lines of a smart country bungalow with terraces, lawns and ornamental waters, but half a dozen geese sometimes swim in the pond. The M&E's beautifully painted four-wheel No. 1 caboose is visible in the background. The M&E is rich these days.

C. M. Clegg.

Wouldn't it be nice if:

. . . TRAINS magazine would organize a movie exchange where 8 and 16 mm. railroad movies could be bought, sold, swapped, and rented? These could include copies of professional films such as publicity pictures released by various railroads, special features released by other organizations (such as "King of the Rails," etc.). In addition, movie versions of some of the articles in TRAINS should be in big demand. For example, a movie version of "Pacific Great Eastern," by Douglass Welch in the December issue, ought to make a lot of sales. An advanced amateur movie photographer ought to be able to make an excellent short of such an article. Then there are all kinds of possibilities for exchanging movies between various railroad clubs, showing their activities. Exchanges and sales between railroad-minded individuals could be another item. What say to this?

Robert S. Coe.

[It's a thought, Mr. Coe. What do other readers think? —*Ed.*]

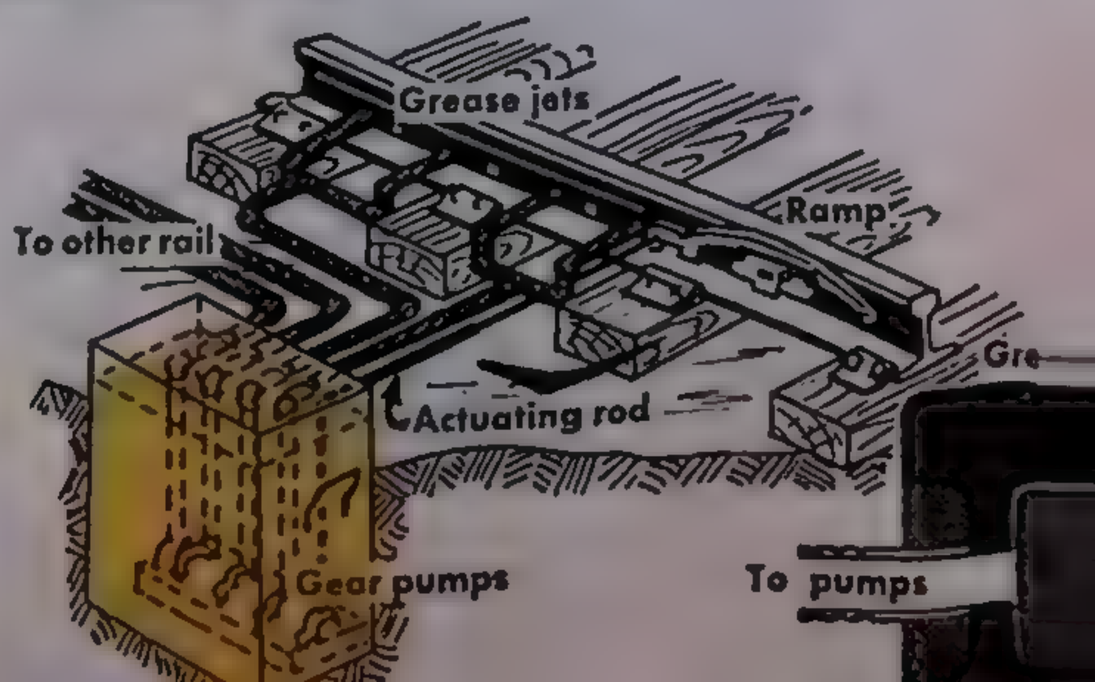
Rail Lubricator Greases Curves

That American Brakeshoe & Foundry Company is engaged in greasing railroad tracks to reduce friction to keep trains going may seem paradoxical to those who picture the company's primary effort as producing friction to stop trains. Brake Shoe's Ramapo Ajax Division has, however, developed an ingenious device known as the Racor Rail Lubricator.

This machine is installed in the track at the beginning of a series of curves. Through pumping action, activated by the passage of each wheel over a ramp, it produces a thin line of graphite grease along the side of the rail head, about nine feet long. As each wheel passes, a supply of grease is picked up by the wheel flange around its circumference. When the wheels go into the curve, they bear against the outside rail and deposit grease on the side of the rail head. After the first curve becomes greased, wheels carry excess grease to the next curve.

Since there is little loss of grease on the straight sections of track between curves, satisfactory greasing is accomplished at amazing distances from the lubricating machine. Extensive tests show that as much as 10,000 feet of average curved rail, within an over-all distance of 10 miles, can be efficiently greased by one machine. An interesting installation has been made on one line climbing the east slope of the Rocky Mountains on which the total curved rail is equivalent to 19 complete circles!

Not only does rail greasing result in a reduction of friction, thereby allowing heavier tonnage trains and higher speeds, but it also results in outstanding reductions in abrasive wear on the rail head, increasing the usable life of rails on curves as much as 10 times in some instances. Comparably, abrasive side wear on car wheels and locomotive tires is reduced, while considerable track maintenance is eliminated.—*Brake Shoe Private Wire.*

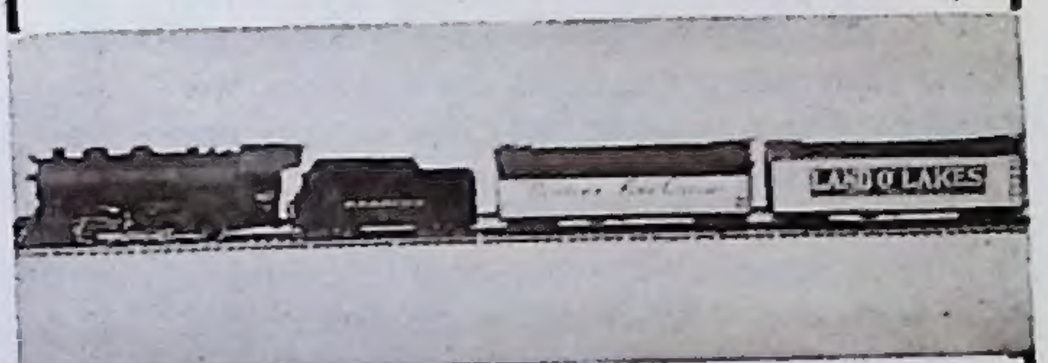


New Railroad Book

POGO'S TRAIN RIDE, by Jo and Ernest Norling. Children's book, $1.25. Published by Henry Holt & Co., New York, N. Y.

THIS is the answer for railroad-enthusiast fathers who have looked vainly for authentic children's books about railroads. A small boy and his dog go for a ride on a freight train, riding first in the caboose and then in the engine, and while they ride the crew explains the mechanics of railroading in simple terms. The language is neither oversimplified to the point where it doesn't make sense, nor is it in language too adult for a child of five or six. Except for one slip (a freight engineer getting his go-ahead signal on an air communicating whistle!) everything is technically accurate, which is some sort of record for a juvenile book. The illustrations are realistic, with plenty of child appeal, and the end sheets are a small boy's wonderland of railroad facts, explained cartoon-style. The automatic coupler, whistle signals, the switch, the air brake, signal indications, and other technicalities are diagramed and the parts labeled.

OWN YOUR OWN RAILROAD



Building scale models of cars, locomotives and even the right of way, itself, is a hobby leading to endless enjoyment.

Write for our booklet on miniature railroading along with our pre-war catalogue—It's interesting reading—Price 25c.

MANTUA METAL PRODUCTS CO.
Woodbury Heights - New Jersey

NEW YORK CENTRAL LIMA-BUILT LOCOMOTIVES

Scoop Water at 75 MILES AN HOUR

into specially designed tender tanks

New designs of water scoop have been developed by the New York Central, and Lima is building tenders incorporating improvements in overflow equipment so that water can be taken safely at 75 miles an hour.

This equipment has been installed in tenders of Class L-4b 4-8-2 locomotives now in service, and fifty new large-capacity tenders with this arrangement are also being built for the New York Central by Lima.

LIMA LOCOMOTIVE WORKS INCORPORATED

LIMA LOCOMOTIVE WORKS, INCORPORATED, LIMA, OHIO

THERE'LL COME A DAY

Once upon a time we advertised "All book orders shipped same day received." Let's see, that was about three years ago, best we can remember. That was back when we could hire an extra girl for the mailing room every time orders picked up; when we could phone the bindery for more books and get them right back. That was when we had printers enough to run two shifts regularly in our pressroom, and when paper could be had at the drop of a hat—or at least at the flip of a checkbook. And that, we were smartly reminded this Christmas season, was a long time ago.

For if ever anyone got swamped under an avalanche of orders which couldn't be taken care of with dispatch, it was us this Christmas. The flood of orders was something such as we only dreamed of back in those days when we could ship all orders "same day received." And with all these new customers you can bet we wanted desperately to show off our best service. We called for volunteers, and a crew from the editorial department worked Saturdays in the mailing room. Others worked evenings. We set up a production line, one person typing labels, another checking order slips, the next picking books off stock shelves, the next wrapping and the next computing and fixing postage.

But even if we could have wrapped most orders, we ran out of books. Our shelves seemed perpetually empty. The binder couldn't keep up with our almost hourly pleas for more of this and that, particularly the new photo albums. We sold more albums in one month than we had previously sold in an entire year.

As you will find out when they are delivered to you (oh happy day!), there's good reason for the popularity of this new series of dollar photo books (Southern, New England, Electric, Pennsylvania Railroad, and New York Central). They are adorned (plug) with a new type of cover and the inside photos include a larger proportion of 14-inch prints. We are getting more albums back from the bindery constantly and shipping them as received. If we've been slow in answering complaints or inquiries from you, it's because we feel the best answer is to concentrate every bit of available manpower on getting the orders out.

So please stick with us. We'll do the very best we can for you. And there'll come a day when the W. M. C. will let us (maybe even urge us to) hire more help. Meanwhile we hope you're buying war bonds regularly to help win the war.

KALMBACH PUBLISHING CO.

1027 N. 7th St. Milwaukee 3, Wis.

Correspondence

I have been a passenger trainman on and off for the past 20 years, and if Mr. Illian [December TRAINS] thinks any trainman can please all the people in three or four coaches at any one time regarding the ideal amount of heat, he has a very limited knowledge of human nature. The average coach holds between 70 and 80 passengers, all of different ages and conditions of health, and having far different attitudes regarding the perfect temperature for their particular personal comfort. I do not think that any passenger trainman has, as Mr. Illian suggests, the attitude of "To hell with the public." I think we do pretty well, considering that we are carrying today the greatest number of passengers in our history.

Frank J. Nolan, Delaware & Hudson RR., 1116 State St., Schenectady 4, N. Y.

The Erie does not have a station at Meadville, N. Y., if there is such a place in New York. On page 4, January TRAINS, you refer to "Meadville, N. Y." Erie's Meadville is in Pennsylvania.

Anonymous.

[Sorry, Anon; you're quite right.—*Ed.*]

Neither the Erie's Matt Shay nor the Virginian's 2-10-10-2's were the world's most powerful steam locomotives from the standpoint of tractive force, as stated in November TRAINS. This honor belonged to the Virginian's great 2-8-8-8-4 Triplex locomotive built in 1916 by Baldwin and rebuilt five years later into two smaller locomotives because of its inability to produce enough steam for so many cylinders. Although slightly smaller than the Erie machines, it developed more pulling-power because of smaller drive wheels and a slightly higher boiler pressure. Here is a comparison of the two Triplex engines and the 2-10-10-2's.

	Erie 2-8-8-8-2	Virginian 2-8-8-8-4	Virginian 2-10-10-2
Road numbers	5014-5016	700	800-809
Cylinder diameter and stroke, in.	36 x 32(6)	34 x 32(6)	30x48x32(4)
Driver diameter, in.	63	56	56
Steam pressure, lbs.	210	215	215
Grate area, sq. ft.	125.5	108	108.7
Locomotive weight, lbs.	860,400	844,000	684,000
Tractive effort, lbs. (simple)		199,560	176,000
(compound)	160,000	166,300	147,200

Thomas Dworman, 19545 Shrewsbury, Detroit 21, Mich.

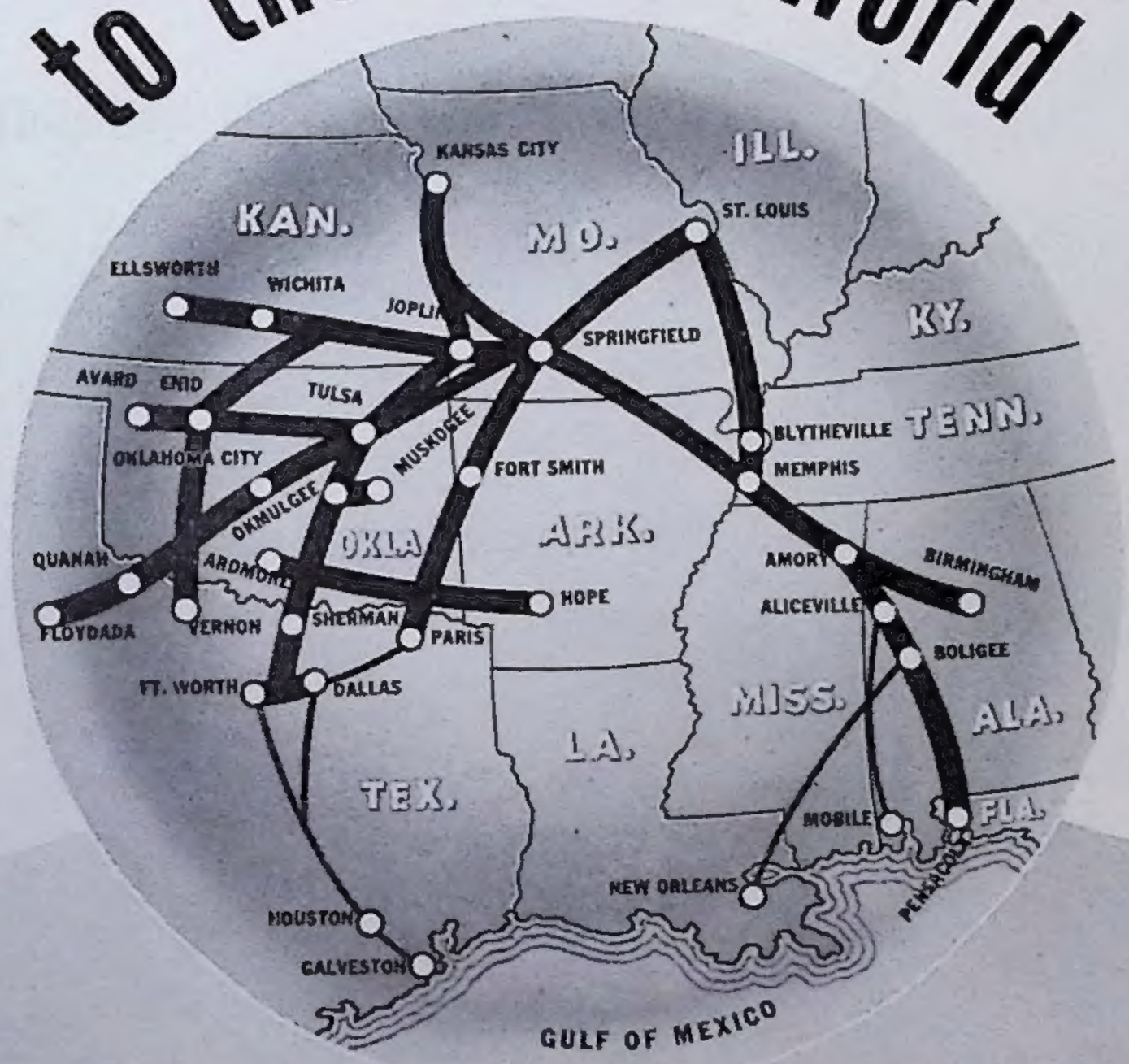
Back in 1915 the Philadelphia & Reading built four 4-4-4 locomotives which enjoyed only a short career before they were rebuilt into Atlantics. They were very unusual, being the first with the four-wheel truck under the fire box, interchangeable with the pilot truck. Hollow axles were used to reduce dead weight; V-shaped guides and crossheads were also used. Last but not least from the standpoint of novelties was a cable reverse gear device which proved a dismal failure. The original No. 110 is now Atlantic No. 351; 111 and 112 are 352 and 353 respectively; 113 is 350. They are still in active service.

T. H. Bateman, W. H. S. Bateman & Co., Philadelphia 2, Pa.

I wonder if any railroad besides the old Fitchburg ever made its conductors walking advertisements for the road's largest tunnel! In my railroad uniform-button collection I have one showing an engine coming out of a tunnel with "Fitchburg Railroad" around the edge. I would imagine that it's supposed to be Hoosac Tunnel. I also have one showing a 4-4-0 with a diamond stack, lettered "Grand Central Depot." An old Boston & Albany button sports a 4-4-0 also, while a B&O South Western has the dome of the Capitol in the center. My collection, which numbers about 300, is by no means complete, but does represent some research.

Donald Van Court, 8 Lee Ave., Madison, N. J.

From the "Frisco World" to the Entire World



Frisco . . . one of America's GREAT railroads . . . makes direct connections with practically every other major railroad in the nation, thereby providing unexcelled transportation facilities to and from the rich Frisco territory. In addition, through Frisco's Port of Pensacola on the Gulf of Mexico, facilities are offered for world-wide imports and exports.

5,000 MILES IN NINE GREAT STATES

Missouri • Arkansas • Oklahoma • Texas • Kansas • Tennessee • Mississippi • Alabama • Florida

FRISCO LINES

ST. LOUIS-SAN FRANCISCO RY.

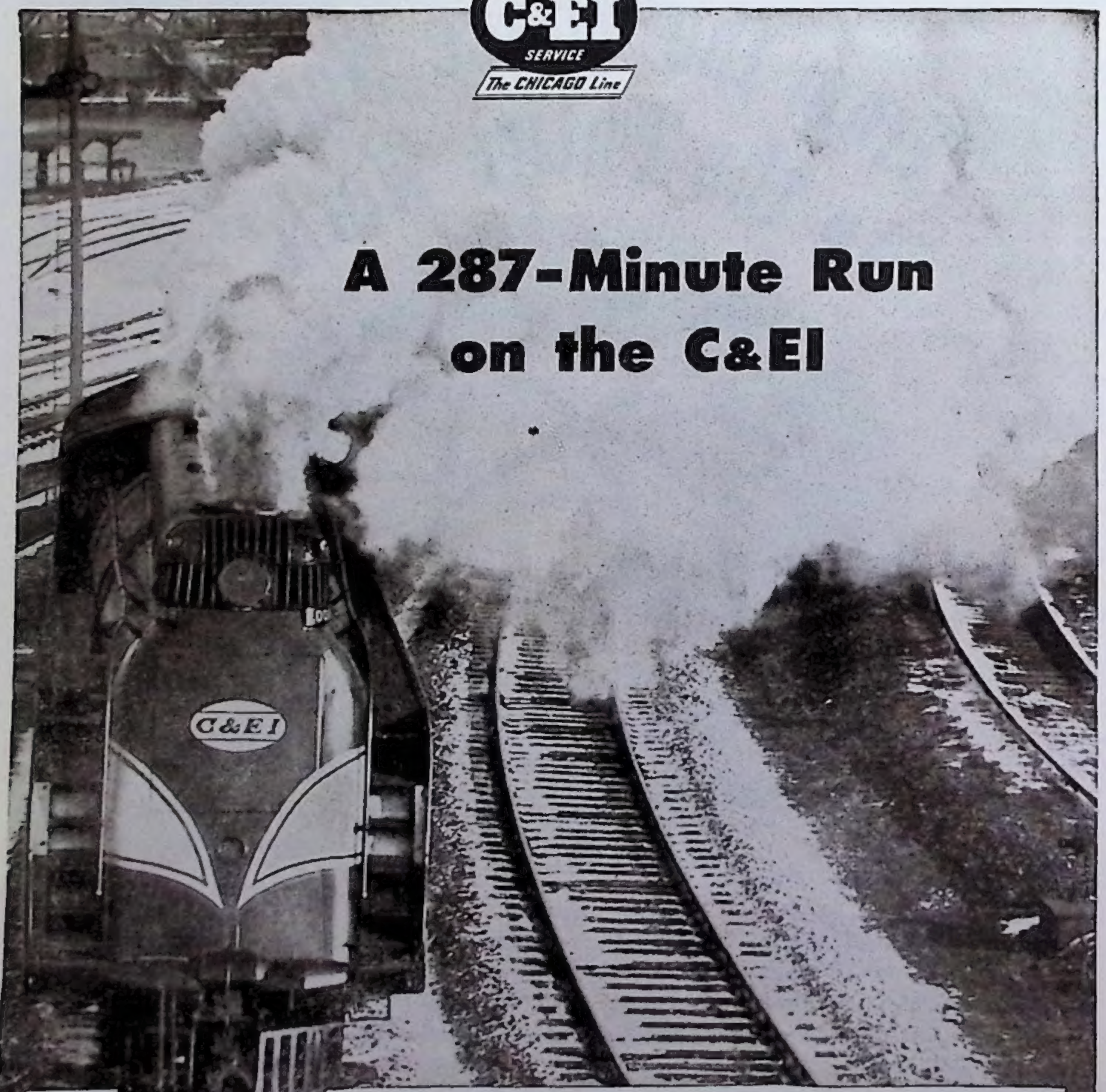
A Great Railroad

FSF FRISCO FASTER FREIGHT

Linking Transcontinental Routes . . . Border to Border and Coast to Coast

SPEED
C&EI
SERVICE
The CHICAGO Line

A 287-Minute Run on the C&EI



If the C&EI right-of-way extended from Aachen to Berlin, the *Dixie Flagler* could make the run in 287 minutes. As it is, the route lies across Nazi fortifications manned by a fantastic armament of destruction.

How many troops—how many million tons of American supplies—how long it will take to smash through this belt of defense—will depend in part on our speed in transporting the tools of war to the firing line.

The C&EI is a division of the American supply system. Its rails connect with the great arsenal of the Middle West, and with the main line to Berlin. It is our job to handle wartime traffic to the limit of our capacity, with increasing efficiency, safety and speed. We pledge every effort to this accomplishment.

CHICAGO & EASTERN ILLINOIS RAILROAD